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LACTATION AND TETANUS IN FOALS.

BY W. H. BLUNT, M.R.C.V.S., LUTTERWORTH.

THE following rather rare cases came under my notice, in my father's practice a few weeks since, which I thought would be worth recording in the VETERINARY JOURNAL. On the 24th June I was asked to look at a foal (filly) a day old, which I did. I found it had a very large mammary gland, quite as large as its mother's, and which was distended with milk that kept continually escaping from it. After keeping the mare short of food for a few days, and giving alterative medicine, both the mammary gland and the milk gradually disappeared. The following week I was again asked to see two other foals a few days old, the property of different owners. I found them suffering from well-marked symptoms of Tetanus, all the superficial muscles being contracted, especially those of the head and neck. The jaws were firmly fixed, the nostrils dilated, the *membrana nictitans* nearly covering the eye. The first died before anything could be done to relieve it; the second lived nearly a day. Perhaps some of the many readers may be able to enlighten us as to the cause of these rather rare cases.

ACCIDENTAL DISLOCATION OF THE LEFT POSTERIOR OS CORONÆ.

BY T. FLINTOFF, A.V.D., 8TH HUSSARS, MEERUT.

LAST month a case of the above nature occurred in a troop horse of the 8th Hussars, and being a most unusual lesion I send it to the VETERINARY JOURNAL for publication.

The horse was found on the morning of the 17th of April unable to bear any weight on the limb; cause not known—the heel-rope, I thought at first; but, on investigation, I found the heel-rope had been on the other leg (off hind).

Diagnosis.—Dislocation of the os coronæ, from the articulating surface of the os pedis in a backward direction.

Every devisable means were unsuccessful in reducing the limb to its natural position. The horse was thrown and a strong rope, with four men pulling at it, was fastened round the hoof, whilst I put my knee to the back part of the pastern, using all possible force, with one hand on the foot and the other on the fetlock, but all to no purpose. Next day, other means were tried. First, by throwing the horse and placing him on his belly, with the forelegs stretched out forwards, and the hind legs backwards. This I did, so as to get the injured limb placed as nearly flat on the ground as possible, with its anterior aspect downwards. Then a very heavy man, with his boots off, was made to jump on the back of the pastern, where the prominence showed most; and afterwards, when these means failed, a strong piece of wood, well covered with leather, was placed (where the hollow of the heel ought to have been) on the most prominent part, and hit several times with a heavy hammer; but all efforts were futile.

Prognosis.—Unfavourable. During the latter operations I had a very strong pressure applied to the hoof, and the horse firmly fastened in every way, and it appeared as though no amount of force would ever reduce the dislocation.

Tautological.—The case was destroyed as incurable on the 30th of April, being of no further use to the service.

Post-mortem.—The os coronæ was found to have slipped out of the articulating cavity of the os pedis backwards and past the

lateral ligaments; these last-named structures prevented the bone being forced forward into its proper position, being firmly locked over the lateral prominences. The capsular ligament was considerably lacerated and inflamed, causing slight effusion and swelling about the region of the coronet.

Mr. R. Poyser, officiating I.V.S., 2nd Circle, and Mr. J. Anderson, officiating superintendent of breeding operations, saw the case with me, and both were of opinion that it was a hopeless one and ought to be destroyed.

OBSERVATIONS ON SOUNDNESS.

BY R. H. DYER, M.R.C.V.S., LIMERICK.

(*Continued from page* 422, *vol. xviii.*)

HAVING described in my former paper the method I consider best to be adopted in the examination of horses as to soundness, I will endeavour to follow up the plan laid down, so as to elucidate the subject as fully as my abilities will dictate. It must not be supposed that I shall attempt to trace the steps of those writers who have preceded me in treating the subject, but shall strike out a path of my own, which will, it is to be hoped, render these observations acceptable to those members of the profession whose practice does not lead them into this branch of veterinary tactics to any very great extent. There are doubtless scores of veterinary surgeons who are engaged principally in a country business, and who cannot, of necessity, be expected to devote as much time to this subject as others of their professional brethren residing in cities. The course proposed to pursue in elucidating the subject will be in accordance with the system carried out in my practical examinations. It must be, however, distinctly understood that they refer particularly to *undisputed* cases.

It may, perhaps, be necessary, in order to make them more intelligible and complete, if that portion of our duties, viz., *post-mortem examinations*, are occasionally made matter of

comment, but as I am not often called upon to investigate cases of this nature, it will not be expected that I shall dwell long upon them. Happily, in this country, but few such instances fall under notice, which fact alone speaks volumes in favour of the system I have so long advocated. The head being the part in our examination to which attention is first directed, I shall proceed to consider the state of the mouth. There are several reasons why we should carefully scrutinise this cavity. In the first place, it is desirous to ascertain the age of the animal, which occasionally is somewhat difficult and puzzling to the practitioner; especially is this so to the youthful ones, as some horses have forward and others backward mouths, and this is accounted for in more than one way. An animal foaled in January will have a more forward mouth at the age of three, four, or five years than one foaled in June, July, or August. Another cause is early or late development of the teething process. This is not so observable in young horses as in children. I have seen three-year olds mark four; a four-year old mark five, and so forth; and occasionally may be noticed that one side of the mouth will indicate the difference of a year to the opposite in the same animal. Some yearling ponies will present appearances of having a full mouth of *permanent* teeth. This remark, however, has reference to the female sex only, simply from the fact that tusks are absent in this sex. Some old horses will have their teeth so evenly worn and perfect, that one of twenty-four years old may pass muster as a six-years old with inexperienced examiners.

This, and more, will be often witnessed in natural cases, so that it is necessary for examiners to make themselves acquainted with all the variations which are likely to occur. When it is known that *art*, now and then, is had recourse to, to aid dentition, it becomes still more incumbent upon us to fully understand what the art is capable of effecting. I need scarcely record the fact that those men designated *tinkers*, *copers*, or screw-dealers are ever ready to tell their customers that the horse shown is *six-off*. This assertion is generally true—he is *six-off*, certainly. Having satisfied one's self that the age is what has been represented or otherwise, the attention should next be directed to the

formation of the mouth, and observe if the incisors are evenly worn and unbroken. By this we can form an idea as to whether the animal is a crib-biter or a wind-sucker. Some horses are so uneasy to clean, and they so lay hold of hard substances with their teeth during the sanitary process, that these become worn and broken at their edges. This is more frequently found in aged horses that have been stabled for years and highly fed, and in some cases those who have been teased by bad-tempered grooms. If the teeth are uneven, it is advisable to have the animal under examination so tied or placed that he may be left alone, with a view of allowing time and opportunity of "cribbing"; but I don't consider that an examiner ought to be, *under any circumstances*, held accountable should he pass a crib-biter, because it is well known that some inveterate cribbers will remain in a strange stable for hours without attempting the habit, and more especially is this the case *when the groom is near him.* I have seen men in charge of horses persistently remain close to the horse under examination, and this act always carries suspicion with it, that there is a *screw loose somewhere.* It is advisable to examine the molars, if this can be done, as caries may exist, or displacement, or irregular growth of one or more. Mistakes have been made, and horses have been condemned as glandered when it was found that a tooth was diseased. There are several diseases of the mouth. Paralysis of the lower lip may be present, or the horse may have a *parrot* mouth, or be suffering from "Lampas." I have seen a few horses with only half a tongue. Either of these affections, in a *legal* sense, would be considered unsoundness.

Assuming that the horse is a crib-biter, what is now our duty? This is a knotty question, and requires investigation. What is a crib-biter, and does the habit constitute unsoundness? It will be interesting to read the opinions of some of the most learned writers of the present century, that we may compare their views with our own. Blaine writes thus: "This peculiar action is generally supposed to arise from a small quantity of air drawn *into* the stomach, and is hence called sucking the wind. . . . It consists in the simple eructation or forcing *out* of a small quantity of gas, let loose from morbid combinations within the stomach, which, as it proves a source of irritation, to aid its expulsion the horse applies his

teeth to a fixed point, by which he gains help of some of the muscles of the fauces to open and straighten the œsophagus, while, at the same time, by means of the abdominal muscles, he presses on the stomach, and forces *out* a little of the irritating air. . . . It is considered a vice, a habit acquired, etc. I believe it always commences in dyspepsia, the consequences of long living on dry food, etc." Again, he writes, "crib-biters seldom carry much flesh." Youatt writes thus: "It is the *inhalation* of air." Here is at once a difference of opinion between those learned men, and they were both practical ones. Their opinions were the very opposite. Youatt goes on to say: "The crib-biting horse is notoriously more subject to colic than other horses."

A case was tried before Lord Tenterden, and thus decided: "*A horse with crib-biting is unsound.*" In vol. i. of the "Veterinary Record," p. 263, the president of the Veterinary Medical Association, whom I believe to have been Professor Spooner, says, "I now proceed to notice another peculiarity which the case presents (it was of obstruction of the base of the cæcum, caused by a large carcinomatous growth), and which is worthy of even more than a passing remark. The horse was a crib-biter. I have opened (he continues to say) the bodies of hundreds of horses which during life manifested this habit, but I never met with a case that did not show some lesion in some part of the alimentary canal, and this has generally been in the stomach. My respected colleague, Mr. Sewell, is, I believe, of opinion that crib-biting always arises from ulceration of the stomach. I am rather inclined to regard it as arising from *functional* derangement of the digestive organs in the first instance, proceeding to structural disease as the habit becomes more confirmed. In this case the stomach presented an unhealthy appearance, and its parietes were irregularly developed, being more dense in some parts than in others. The œsophagus likewise was dilated in places, and where dilated much attenuated in its coats. This atrophy of the œsophagus is the cause which renders crib-biters so liable to be choked, from the food becoming lodged there. And since crib-biting is thus found to be associated with disease, and, moreover, exposes the animal addicted to it to danger, I cannot view it otherwise than unsoundness." Percivall, in vol. ii., p. 198, of

his "Hippopathology," writes as follows: "In the stable tympany is of rare occurrence, unless it be in crib-biters, who are suffered to pass their time in sucking in air." This author seems specially quiet upon the subject. Mayhew, in writing upon it, says, "In submission to general opinion, it has been alluded to as a habit learnt within the stable. The air is much more than inhaled. A large quantity is swallowed with the saliva. No slight amount is deglutated with the masticated food." In the *Veterinarian* for 1853, p. 443, we quote as follows:—"Considerations on Crib-biting, with Eructation, by M. E. Fischer. Although the abnormal action with horses known under the appellation of crib-biting is so often observed, it is still one far from being sufficiently understood. Many of our best veterinary authors have furnished dissertations on the subject, but these present a great variety of opinions touching the causes, seat, nature, and consequences of crib-biting. Whilst one contends that, in the act, the horse swallows atmospheric air, another pretends that the animal ejects air, which act is accompanied with a particular noise, created by gas generated in the stomach. Some say the habit is injurious to horses who practise it, and that it frequently renders them valueless, whilst others maintain that it nowise materially hurts them. The Court (of Appeal) has pronounced in favour of its innocuousness." The writer goes on to say what others have said before, viz., that crib-biting is not a disease of itself. He is of opinion that it should be regarded as a vicious habit rather than a disease. Oliphant, in treating of this habit, says, "Crib-biting being an unnatural sucking in of air, must be to a certain degree injurious to digestion, must dispose to colic, and so interfere with the strength and usefulness and health of the horse. Some crib-biters are good goers, but they probably would have possessed more endurance had they not acquired this habit, and it is a fact well established that as soon as a horse begins to be a crib-biter, he, in more than nine cases out of ten, begins to lose condition. He is not to the experienced eye the horse he was before. The wear of the front teeth, and even the frequent breaking of them, makes a horse old before his time, and sometimes renders it difficult, or almost impossible, for him to graze. Crib-biting which has not yet

produced disease or alteration of structure is *not* an *unsoundness*, but is a *vice* under a warranty that a horse is 'sound and free from vice.' Thus, when an action was brought on the warranty of a horse which had been sold for ninety guineas, the question was, whether crib-biting, which was the *vice* in question, was such a species of *unsoundness* as to sustain the action. The horse had been warranted sound generally. Some eminent veterinary surgeons were called as witnesses, who stated that the habit of crib-biting originated in indigestion; that a horse, by this habit, wasted the saliva which was necessary to digest the food, and that the consequence was a gradual emaciation. They said that they did *not* consider crib-biting to be an *unsoundness*, but that it might lead to *unsoundness*, that it was sometimes an indication of incipient disease, and sometimes produces *unsoundness*, where it existed in any degree. Upon this Mr. Justice Burroughs said, 'This horse was only proved to be an incipient crib-biter; I am clear that it is not included in a general warranty;' and the plaintiff was accordingly non-suited." "In a later case a horse was bought warranted 'sound and free from vice,' and an action was brought against the vendor on the ground of its being a crib-biter and *wind-sucker*. Veterinary surgeons were examined, who said that the habit of crib-biting was injurious to horses, that the air sucked into the stomach of the animal distended it, and impaired the power of digestion, occasionally to such an extent as greatly to diminish the value of the horse and render it incapable of work. Some of the witnesses gave it as their opinion that *crib-biting* was an *unsoundness;* it was not, however, shown that in the present instance the habit of crib-biting had brought on any disease, or had, as yet, interfered with the power or usefulness of the horse. Mr. Baron Parke told the jury that to constitute *unsoundness* there must either be some alteration in the structure of the animal, whereby it is rendered less able to perform its work, or else there must be some disease. Here neither of these facts had been shown. If, however, the jury thought that at the time of the warranty, the horse had contracted the habit of *crib-biting*, he thought that was a *vice*, and that the plaintiff would be entitled to a verdict on that head. The habit complained of might not, indeed, like some others (for instance,

that of kicking), show *vice* in the temper of the animal, but it was proved to be a habit decidedly injurious to its health, and tending to impair its usefulness, and came, therefore, in his lordship's opinion, within the meaning of the term *vice*, as used on such occasions as the present.

It will be advisable at this stage to analyse the various opinions which are here recorded, so that we may arrive at some definite conclusion upon this disputed question. Blaine believed it to be a *vice;* but he stated *it always commences in dyspepsia.* If it always commences in dyspepsia, it should not, I think, be called a *vice.* There seems to be some inconsistency in his reasoning. Youatt wrote in favour of its being an unsoundness. He wrote, "The crib-biting horse is notoriously more subject to colic than other horses." Spooner said, "I cannot view it otherwise than *unsoundness.*" Fischer considered the habit one of *vice* only. Mr. Justice Burroughs considered it to be a *vice;* Mr. Baron Parke was of the same opinion, viz., *vice.* This is perplexing.

It is difficult for practitioners to write certificates, with all I have written of the opinions of leaders of the profession, or to tender evidence in a court of law, without being subject to ridicule. In nearly every instance, writers have stated their belief that the "habit" commences in dyspepsia, and that it is likely to go on to produce structural derangement of parts within the alimentary canal. It may naturally be asked, When are we to make up our minds as to the actual moment structural change commences? What symptoms are to be looked for in a crib-biting horse to lead to the inference that a lesion of any portion of the alimentary apparatus has taken place? Until these questions are satisfactorily answered, and one's attention can be so directed as to diagnose those appearances or symptoms possessed by an animal addicted to the habit, it would be presumption on the part of any individual to state that this or that crib-biter is a *sound* animal, without running the risk of being censured by one party or the other. We, most of us, have known horses which have had the habit for several years, and they have fed well, worked, and looked well. This, however, is no proof that they are not diseased. Doubtless,

there are many members of the profession acquainted with hundreds of horses whose constitutions are at fault in some way or other; still they perform their work satisfactorily. This is no proof that they are not unhealthy. I knew a horse who used to journey twenty-four miles a day at a fast pace, and whose "strap" he carried upon his harness collar to and fro, so that it should be placed in position immediately on his arrival at his stable. This horse was extremely good as a poster.

No remarks have been made by me in regard to what is termed *wind-sucking*. It may reward us if we inquire if there is in *reality* such a habit as *wind-sucking?* For my own part, I never did or could believe that horses *suck wind.* The air, or gas, which is in the stomach is *generated there* precisely in the same manner, we know, in which it is formed in man. Decomposition of the food in the stomach occurs, and fermentation takes place speedily, and the formation of gas is a natural result; but the act as seen, which has given rise to the term wind-sucking, is nothing more than what the instinct of the animal prompts it to do, in order to disencumber itself of the unpleasant sensation present in the stomach at such times. I think the subject may be disposed of after relating one instance (wind-sucking). I stood behind a mare as she was quietly eating hay in her own stall, and all at once she commenced to perform the act so well known by horses afflicted with this complaint. In the course of five minutes the abdomen of the mare was so swollen that it seemed as if it would burst; it resembled the worst case of "Hoven" in cows I ever witnessed. In as many more minutes the swelling disappeared.

Now, it would have occupied a considerable time for so much air to have been sucked in as must have been in the stomach of that animal. I submit, and that respectfully, that the idea of *sucking in air* ought to be exploded. It is an utter absurdity for any man to believe in such nonsense. One would imagine that any physiologist declaring such to be his conviction, that he was entirely ignorant of *himself*, or, in other words, of comparative anatomy, physiology, or pathology, to say nothing of the laws of chemistry.

Nature never intended a horse to crib; this is the first pro-

position ; and the next is, that it is universally believed to arise from indigestion ; and, thirdly, that if continued, structural alteration of parts will take place ; and, lastly, it has been declared that such horses are more liable to colic than others. It does not therefore follow that because an animal looks well, feeds well, and performs his work well, that his internal parts are not diseased. Those of us who have had much experience amongst horses, know that but few horses under our superintendence are entirely free from some complaint or other, and yet they do their work. If we turn to the human subject, we find numberless instances of men and women whom we know to have diseased structures; still they do their ordinary business, but certainly not with the same degree of *comfort* to themselves as if they were free from disease. In closing this I would merely add that it does not prove, then, that diseased structure cannot, or does not exist, because we are not in a position to demonstrate it.

A crib-biting horse is, to all intents and purposes, an *unsound* one. He should be denominated, if nothing else appears against him, a *practically* or *usefully sound* horse.

(*To be continued.*)

DIFFUSE CELLULITIS (CELLULAR ERYSIPELAS) SUPERVENING ON CASTRATION.

BY J. MATTHEWS, F.R.C.V.S., A.V.D., 17TH LANCERS, LUCKNOW.

THE following case being of somewhat uncommon occurrence, it may perhaps interest the readers of the VETERINARY JOURNAL.

Early last month I was asked to operate on a vicious mule, the property of a trooper (sowar) in the 2nd Bengal Cavalry. The age of the animal was twelve years, and it had been bred in the Punjab. It had been decided to castrate it with a view to rendering it more tractable. The testicles were removed on the 9th May, the cords being divided by the actual cautery ; little tumefaction followed, and recovery seemed certain, until the 24th, when a downfall of rain occurred, succeeded, as usual, by intensely muggy, steamy weather. Thermometer was 98° F.,

and a steady east wind set in. The wounds in the scrotum, which had nearly healed, discharged sanious fluid, and looked unhealthy, whilst along the back there was a swelling over the *longissimus* and *latissimus dorsi* muscles, acutely sensitive to pressure, which, if continued in either direction, produced a faint crackling sound. Pulse full and 53. Acute pain was evinced when the patient was moved, and when left to himself he stood with a look of extreme dejection, and gathered "in a heap." The bowels were constipated.

A purgative was at once administered, and occasional enemata. Locally, a hot, wet blanket, well wrung out, and covered by a dry one, was kept over the back. The next day the pulse was 48 and the artery more relaxed; but there was no disposition to eat, though, generally, the mule was more comfortable in appearance. The wounds in the scrotum were enlarged by the finger, and well syringed with warm water. The swelling on the back pitted slightly on pressure, which caused less pain than at first. The purgative took effect in the evening. Repeated doses of Sal ammoniac in water were given, and these he drank freely. There was little change for five days, except that the appetite gradually returned. The east wind now dropped, the swelling rapidly disappeared. The animal recovered, and has since rejoined, much improved in manners by the operation.

It is curious to note that I had six other patients in different parts of the cantonment recovering from this operation, all of which were more or less affected by this change in the weather, though healing very rapidly till the rain fell, the wounds, for the time, assuming an unhealthy appearance.

One case—a chestnut arab, aged, on which I had operated by torsion about five days previously, became affected with chronic spasms of the muscles of the neck, abdomen, and hind legs, though not involving the *retractor oculi* muscles. A strong cathartic was administered, and as the bowels responded the spasms diminished in frequency and intensity. Local means were taken to reduce irritation, and the wounds were kept clean, etc.

VETERINARY REPORT ON BENARES.

BY VETERINARY SURGEON R. W. BURKE, M.R.C.V.S., A.V.D., BENARES.

(*Continued from page* 13.)

Case 68, G 48. Admitted on the 14th of May. There appear on the mane and tail—parts covered with longest hairs—numerous little *papules*, some of which, during their growth, and from the nutrition of the cuticle being destroyed, are covered on their surface by *minute* white crusts, and presenting an appearance which is pathognomonic of this disease, the formation of these crusts being copious and attended by considerable itching, and, in the later stages, by heat, soreness, and other symptoms of acute but superficial inflammation, owing to the parts being rubbed by the animal from extreme Prurigo. Potass. nitras. ʒiv. in water to drink, morning and evening, by way of relieving cutaneous hyperæmia, by causing hyper-action of the kidneys instead. Give a physic containing Aloes Barb. ʒiii. p.; Pulv. zingib. ʒiii.; ft. bol. Clothe the body warmly during the action of the purgative prescribed. Allow plenty of cold water to drink, and linseed one pound per diem in addition to his ordinary ration. Locally, applications of kerosine and cheerpine oil, diluted with equal parts of Ol. lini., after first clipping the hair of the affected parts—to be rubbed in with friction of the hand.

June 5th.—Has had several applications of the above, and was washed in the interval with soap and warm water. This case has made a good recovery in the short time it has been under treatment, when compared with some of the other cases of a similar type. Prescribed tonics for the next few days.

June 14th.—Discharged cured.

(*d*) *Erythema.*—Here, again, I was obliged to omit a great number from the register of sick horses, owing to its great prevalence, but non-severity of most cases, noting only the worst, which required special treatment. I will only describe the course and treatment of one case, from the record of treatment:—

Case 91, G 97. *Erythema.*—Admitted on the 25th of July.

Circumscribed patches of superficial inflammation of the cutis, covering the neck, shoulder, etc. Prescribed a cathartic; blanket to body.

July 26th.—Bowels relieved; alkalinated water to drink. Locally, applications of Ol. terebinthinæ puræ.

August 29th.—Has had several applications of the oil of turpentine, and appeared better and worse. Alternate this dressing with that of "phenyle," conveniently diluted with water to make a milk-like lotion. Allow, with his daily feed, Sulphur sub. ʒiv.

September 8th.—Much improved; the lumps in the skin have all receded, especially since the phenyle dressings have been employed.

15th.—Discharged cured.

(*e*) "*Bursatti.*"—Any description of the pathology of this disease to be adequate, must require a comprehensive answer, and greater consideration than this report demands; therefore I defer minute description of the subject to another occasion. I would only express my conviction, already given, that I regard the disease as in every respect analogous to that variety of Cancer in man which has been specially studied and described by Billroth—a summary account of which may be seen in the recent edition of Wilks and Moxon's work on "Pathological Anatomy," and elsewhere. Whether we consider the histological, macroscopical, clinical, or pathological aspects of these "two diseases," their identity becomes equally established; and I cannot, in view of these facts, assent to the parasitic theory of the disease that has been advanced, which is based on hypothesis, and will not stand the test of competent inquiry. I may add that specimens of the sores lately submitted for examination at the Brown Institution, London, failed to prove the parasitic nature that was previously claimed for the disease by some veterinary surgeons. And Dr. George Thin, a leading microscopist in England, also denied this view of the disease after a careful examination of the morbid products made on a former occasion.

The disease is both non-infectious and non-contagious. It cannot be inoculated. I have myself inoculated, this year, five ponies and several dogs (which I had caught for my experiment

at two annas per dog), by introducing subcutaneously appreciable quantities of the discharge, or tissue detritus, from the sores of horses so affected; but in no case was the disease reproduced, although I watched the history of some of my patients after inoculation for over two months, and one for a little over five months. Intravenous injection has been already tried, with similar results. It is, therefore, non-communicable.

*Pathological Anatomy.**—Speaking from previous experience of the disease, I must observe that exactly those changes found *post-mortem* in cases of Cancer are found on *post-mortem* examination of horses that have died of, or been destroyed for, Chronic Bursatti, viz., pseudo-tubercles in the lymphatics and viscera, especially in the lungs and liver; (2) changes peculiar to Fibroid Phthisis in man are found here, with indurated "lumps" scattered throughout the pulmonary texture, the result of fibroid substitution; (3) total absence of suppuration in connection with the lesions found *post-mortem;* (4) the presence of numerous pseudo-bronchi seen on cutting the lungs, which on closer examination are found to be cavities emptied of "kunkur," or pseudo-tubercle, above described.

Clinical Characteristics.—Absence of true suppuration in the sores externally seated, the discharge from the latter being more of the nature of *tissue-slough*, or sero-sanguineous in character, but seldom partaking of the character of true pus, except when due to accidental irritation of the surrounding tissues, brought about by various causes, such as that produced by the action of the air, by irritant caustics used, and so on.

Recurrent Nature of the Disease.—I am aware that a period of *respite* characterises the history of the sores, during which time apparent "cures" have been said to have been established. This feature of the disease is very deceptive, however, and apt to confound proper statistics being drawn of the disease, as it is seldom finally eradicated, except in very rare instances; and those who think they have "cured" Bursatti are furnishing only another instance of the many cures said to have been established in cases of Cancer in man. A respite, in our opinion, does not constitute a cure proper of the disease.

* I may state that this portion was omitted from the report submitted.

Periodicity.—I would object to the use of this term here, as meaningless. When I say that I have seen the disease occurring during every month in the year, and recurring as indiscriminately with regard to any proper time, the notion that it is confined only to the season of the rains will be at once dispelled. I would observe, however, in this connection, that, in the majority of cases at least, the *severity of disease*, when present, *is* pronounced in the wet weather more, perhaps, than it is so during other months; and this fact is not without explanation. The solution of the problem is already forthcoming when we reflect on what has yet been ascertained in respect of the clinical history of Cancer in man. It is held by Dr. Moxon* that this feature of the disease, Cancer, is explicable on the ground that it is characteristic of Cancer structure for its cell changes to become augmented in proportion as the moisture that is applied to it; and is it incomprehensible to understand, then, how this moisture in the atmosphere, during wet seasons in India may, and does, increase the morbid process in the sores in proportion as it is found greater than during other seasons, and give respite to the disease in proportion as it subsides again at the approach of autumn, as it is seen to do in the large majority of cases at least?

Mortality.—In this feature alone Cancer of the horse differs, perhaps, from Cancer as it occurs in man. It runs a more rapid and fatal course in the latter, whereas it is less rapid, less fatal and insidious and deceptive in its behaviour in the system of the former. Probably this is in great part explicable on the ground that our equine patient is less susceptible to taking the disease in the more acute form as often seen in man. Yet it cannot be denied that the same cachexia, the same debility recorded as characterising the subsequent history of human Cancer, are seen characterising also the history of equine Bursatti during the later stages. And if we refer to the experience of some of our most practical veterinarians in the country on this point, we find it stated on their authority that many cases of Bursatti have terminated fatally, just as most cases of Cancer terminate fatally in human practice. Indeed, several cases are within my own recollection where the subjects of Bursatti were, during

* Jones and Sieveking's "Pathological Anatomy."

subsequent attacks, and sometimes in the first attack, that reduced in condition, from general blood dyscrasia, that they were a spectacle much too cruel and painful to behold, and were therefore shot, or otherwise destroyed. Moreover, the mortality of the disease in man is greatly heightened by recourse to operation, which is admitted by all practical surgeons to increase, instead of diminishing the activity of the disease process, bringing about rapid death ; whereas the horse is seldom subjected to this mode of treatment for Bursatti.

Temperature.—A total absence of pyrexia characterises the first stages of this disease, as in Cancer in man ; and it is not until the later stages, when exhaustion supervenes, that the temperature is at all heightened in either patient.

Specific Properties.—It occupies an intermediate position in the boundary line between truly specific and sporadic affections. (*a*) It is non-contagious. (*b*) It cannot be inoculated to the same or other species, all experiments thus conducted having failed to reproduce the disease in another animal. (*c*) It runs no definite course, but is insidious and irregular in its action, and depends for its activity on that some irritant be applied to it in the shape of an exciting cause.

(*f*) *Liver Disorders.*—Considering the character of the climate peculiar to the district, which is hot and moist, the number of cases of liver and skin disorders would naturally be expected to be high. In point of fact, however, this holds true only as regards the latter, of which some of the worst alone have been recorded, disease due to derangements of the liver being comparatively few ; indeed, only five, which showed symptoms of pronounced illness, received any remedial treatment, the others being left to the work of nature to overcome.

Herewith the course and treatment of a case, from the record of treatment :—

Case 53, G 6.—Fever, bilious. Admitted May 1st. Has only just recovered from an attack of "Skin Disease" (Ptyriasis), and is said to have suffered similarly during previous years. Presents an icterous condition of the visible mucous membranes, accompanied by slight febrile symptoms ; dulness of demeanour, loss of appetite, constipation of the bowels, and fœtid, mucus-coated

fæces; pulse, 54, and weak; temperature, 101·4° F. Aloes Barb., ʒiij; Pulv. zingib., ʒiij; mass. comm., q. s., ft. bol. Warm clothing to body during the action of the cholagogue prescribed. Sinapism to region of liver. Et, Spts. ether nit., ʒiss; Camphora, ʒij; Pot. nit., ʒiij; Aqua Oi, ft. haustus, every four hours.

May 2nd.—Bowels relieved, fæces unusually dark in colour, very fœtid, and containing much mucus and water. Continue febrifuge medicine, above described, twice daily. Plenty of cold water to drink, to assist the action of the cathartic administered.

May 3rd.—Fæces still offensive, and mixed with mucus shreds. Jaundiced condition of the membranes less marked. No fever. Pulse, 38, and very weak; temperature normal; appetite regained. Prescribed the same medicine for the next few days, conjoined with tonics; Et, Calomel ʒss, in elect. Ordered bran mashes and plenty of lucerne grass. Daily exercise.

May 5th.—No pyrexia. Pulse, weak and irregular. Increased the dose of ferrous sulphate to six drachms per diem, combined with Pot. iodid. ℈i twice daily.

May 8th.—Convalescent. Daily walking exercise and tonic medicine. Liberal diet.

May 25th.—Debility is the only symptom remaining, as evidenced by the loss of muscular condition, pallid membranes, weak pulse, etc. Put on ordinary daily ration, with an extra pound of linseed per day, and plenty of lucerne and guinea grass from the battery beds. Tonics.

July 15th.—Tonic medicine, good feeding, and daily exercise, have been had recourse to uninterruptedly, and the animal has slowly gained in condition. Allowed rest, good feeding, and walking exercise till the end of the month, when he was discharged. Has proved a protracted case.

THE INFLUENCE OF HEREDITY AND CONTAGION ON THE PROPAGATION OF TUBERCULOSIS.

(*Continued from page* 29.)

As a pathognomonic sign of this affection, he considered the existence of the caseiform matter contained in the tubercles—matter which, according to him, consisted in a mass firm at first, then granulous, and latterly purulent; this mass is always homogeneous, opaque, white, yellow, or greyish in tint, and may be present in the form of enkysted or non-enkysted tubercles.

Laënnec followed the path indicated by Bayle, but he simplified the subdivisions created by him; he admitted only one kind of Phthisis—Tuberculosis—and declared that Scrofula was tuberculous glands; and he included under the general designation of *Phthisis tuberculosa*, Scrofulosis, which he qualified as Tuberculosis of the lymphatic glands.

Microscopical investigation became gradually extended, and it was soon imagined that particular elements had been discovered in the tuberculous matter—the "tuberculous corpuscles." Cells of different forms were found, which some investigators considered were emigrated leucocytes of the blood, and others thought were epithelioïd cells. It was only at a later period that the presence of giant cells, containing numerous granules, were noted in the tubercles; some observers even pretended to have observed a fine network containing cells in its meshes; but it was soon perceived that neither the epithelioïd nor the giant cells were characteristic elements of tubercle.

The labours of Virchow gave a new aspect to the theory of Tuberculosis. The learned Berlin professor proved that all caseous matter was not necessarily tuberculous; for, said he, if tubercles caseify, other neoplasms also undergo this transformation. According to him, we should only qualify as tubercles the caseous products derived from sub-miliary non-vascular nodules, composed of spherical cells similar to the white corpuscles of the blood, not exceeding the size of a grain of millet, and at a late period undergoing caseification.

Virchow has recognised that, at the same time and in certain circumstances, tubercle is nothing else than an inflammatory

product, and that it is an *infectious* affection; and he establishes a distinction between Tuberculosis and Scrofulosis, Caseous Pneumonia, inflammatory exudates, and different neoplasms.

About the same period, Buhl also published his opinion that Tuberculosis was an infectious, and at the same time specific malady, and maintained that the tuberculous virus may be formed not only in the tubercles, but also in the caseous centres.

Finally, Villemin, by his important experiments, already referred to, demonstrated that Tuberculosis was undoubtedly an infectious malady, and that the virulence of the tuberculous matter is precisely the *criterium* of the tuberculous nature of a product.

From this time observers and experimenters have endeavoured to discover and to isolate the tuberculous virus from the morbid matter, and to study its exact nature.

Koch has solved the problem in demonstrating, by certain microscopical arrangements and special staining, the existence of certain minute elements, hitherto unobserved, in all the organs affected with Tuberculosis; these elements are veritable *Bacteria*, and their presence is characteristic of Tuberculosis.

As important consequences follow this precious discovery, we may allude to it for a moment.

According to Koch, the *Bacteria* of tubercle manifest themselves in the form of threads of extreme tenuity, in length scarcely one-half the diameter of a red blood-corpuscle, and in breadth at most one-fifth of their length. They are non-motile, without proper motion, and form spores, which are developed during the life and in the body of the affected creature. They are never mixed with micrococci or other *Bacteria* in tuberculous centres protected from the air. Therefore it is that we find them unmixed in recently-formed tubercles, though they are often accompanied by other proto-organisms in sputa or vomicæ —in a word, where the air may come into contact with them.

In all cases in which the tuberculous affection is at its commencement and is making rapid progress, the *Bacteria* are in large numbers; but when the disease is developed slowly, these proto-organisms are only met with in small quantities in the parts altered by the disease, and they may even be entirely absent in the places where the malady remains stationary.

Koch does not wish it to be concluded, from the existence of *Bacilli* in the tuberculous neoplasms, that these parasites are the agents which cause the formation of the growths; for though he is led to believe that a close connection may exist between them, it is as yet merely a conjecture, which can only be established as a fact after further researches.

In order to prove that Tuberculosis is a purely parasitic malady, caused by the invasion of *Bacilli*, and especially by their growth and multiplication, it is necessary to isolate and cultivate them in a state of purity, free from every heterogeneous element and until every morbid product from the tuberculous animal and which might adhere to them, is got rid of. This Koch has done, and these isolated *Bacilli* he has transplanted in animals, and by this inoculation he has produced the morbid phenomena of Tuberculosis, such as are observed following experimental inoculation of the virus.

It was only after numerous attempts that Koch was enabled to obtain these pure cultivations; and with this object, he employed as cultivating fluid the serum of cow or sheeps' blood, sterilised, and kept at a temperature of 37° to 38° Cent. In this artificial soil, the tubercle Bacilli only developed at a temperature of 30° to 41°; and the cultivations obtained in favourable conditions appeared to the naked eye in the form of small dry scales, which scarcely adhered to the gelatine or nutritive serum, which they never fluidified, as do the *Bacteria* of Anthrax. These scales or films only became visible towards the second week of cultivation—usually after the tenth day, and they grew so slowly that it was only about the third or fourth week that they attained the size of a poppy seed. These peculiarities, special to such cultivations, distinguish the *Bacilli* of Tuberculosis from all others yet known. Whether the *Bacilli* are obtained from human or animal tubercle, the result of cultivation is always the same; there exists no difference between the *Bacilli* of these two groups of tubercles.

By the inoculation of the *Bacilli* thus cultivated in the pure state, inoculation tubercles have been produced, with all the characters of ordinary tubercles, in experimental animals, and this even when the quantity of matter inoculated was very small.

In the intentionally-produced neoplasms, the *Bacilli* were constantly present, and when removed from the growths they could again be cultivated and again be successfully inoculated.

By numerous researches properly controlled, Koch has proved that it was impossible to produce the typical alterations of miliary Tuberculosis by the inoculation of other matter than the *Bacilli;* and he took great care, in his experiments, to adopt the necessary precautions to avoid confusing their results with spontaneous Tuberculosis, as well as to keep the experimental animals from exposure to any fortuitous cause of infection.

From his researches, Koch concluded that *the presence of Bacilli in the tuberculous masses constitutes not only a concomitant fact in the tubercular process, but that it is the cause; and that we should see in the Bacilli the cause of Tuberculosis—a cause which had hitherto only been suspected, and which presents itself to us in the form of a vegetable parasite.*

Koch found exactly the same pathogenic parasites in the miliary nodosities from the lungs of eleven people affected with miliary Tuberculosis; he has also always found them in the tubercles of the spleen, liver, kidneys, pia mater, and in the caseous bronchial glands; as likewise in cases of Bronchitis and caseous Pneumonia (in six cases with formation of caverns, in the majority of which the *Bacilli* were very numerous), in an isolated cerebral tubercle the size of a nut, in tuberculous nodules developed around ulcers in the intestines in cases of intestinal Tuberculosis (two cases), in scrofulous glands recently removed (two or three cases), and in fungous Arthritis (two of four cases).

Koch has also found the same parasites in *ten animals affected with Tuberculosis, and which had calcareous nodosities in their lungs; several times he has discovered them in nodules on the peritoneum, as well as in the bronchial and mesenteric glands.* He has also found them in three cases in which the lungs did not present those characteristic nodosities with rounded surface, which are observed in ordinary Pulmonary Tuberculosis; in these cases, in the lungs there were spherical nodosities, with smooth-walled cavities, filled with a thick, pulpy, and caseous matter. This is a form which is not usually regarded as Tuberculosis.

The presence of *Bacilli* was also remarked in a lymphatic gland from the neck of a *pig*, in the organs of a *fowl* which had died of Tuberculosis, in the tuberculous nodules from three monkeys, nine *guinea-pigs*, and seven *rabbits*, which had died naturally. Besides these cases, which may be said to be spontaneous or accidental Tuberculosis, Koch examined thirty-two rabbits, seventy-two guinea-pigs, and five cats intentionally infected by tuberculous matter, and in all he found the *Bacilli* in the pulmonary tuberculous nodosities.

The facts established by Koch have been confirmed by the investigations of the principal authorities in mycology and pathology. These facts have not yet been seriously contested, and they demonstrate that, with regard to etiology, human Tuberculosis is identical with that of animals. The researches of the illustrious Berlin *savant* possess the great merit of having again drawn attention to the question of the consumption of the flesh and milk of phthisical animals, as well as to the care to be observed in vaccination.

In addition to the facts furnished by the discovery of Koch, which has settled the question as to the identity of human and animal Tuberculosis, reference should be made to the valuable investigations in this direction by Villemin and Klebs. These two able experimenters have demonstrated that *tuberculous matter derived from man will produce Pulmonary Phthisis in animals, and this inoculated Phthisis may be transmitted, by inoculation, to other animals.*

It can readily be understood that experiments to prove the transmission, *by inoculation*, of tubercular Phthisis from animals to man, with the object of producing Tuberculosis, must be excessively rare. With regard to inoculation from man to man, it is reported that Demet, Paraskeva, and Zallonis, inoculated with the sputa of a tuberculous patient, a person dying from progressive gangrene of the big toe, and who was apparently free from tubercles. He died thirty-eight days after inoculation, and on *post-mortem* examination recent tubercles were found in the two anterior lobes of the lungs.*

* *Fleming:* "British and Foreign Medico-Chirurgical Review," 1874, p. 473. *Johne:* "Geschichte der Tuberkulose." 1883.

The following case of transmission of bovine Tuberculosis to man, related by Dr. Stang, of Amborach, has gone the round of the medical press. A boy, five years old, apparently strong in constitution and descended from healthy parents, whose progenitors were exempt from hereditary disease, was attacked with Scrofula, and died in four weeks from Miliary Tuberculosis of the lungs and enormous hypertrophy of the mesenteric glands. When making the autopsy, it was accidentally ascertained that some time before the parents had to destroy a cow, which, according to the testimony of the veterinary surgeon, was affected with Pulmonary Phthisis. The animal had been a good milch cow, and for a long time the boy had received a quantity of the milk, immediately after it was drawn.*

Another argument in favour of the identity or close relationship between *Tuberculosis of man and of animals, is to be found in the analogies existing between these two diseases in regard to contagion and heredity.*

* It is very difficult to trace infection from diseased cows to mankind, as there are so many obstacles and objections to be overcome in accepting, as conclusive, evidence in favour of direct transmission, either through the flesh or milk. At most the evidence is only presumptive; but it is by no means scant, and might be largely supplemented if inquiry were made.

For instance, in the discussion on Tuberculosis, at the meeting of the National Veterinary Association, held in London, in May, 1883, Mr. Hopkin said: "If we feed children on diseased meat, will it produce Tuberculosis now or ten years hence? I had an assistant who came to me from one of the islands on the coast of Scotland. The family from which he was derived was healthy and strong; but when two of his sisters were young, the herd of cattle became affected with Tuberculosis. These girls were fed upon milk from these cattle. The two brothers, who were more fond of whisky than milk, are still hale and healthy—the sisters are lying in their grave, victims to Tuberculosis."

Human morbid anatomy also furnishes what may be deemed presumptive evidence, such as is given in Creighton's "Bovine Tuberculosis in Man." Judging from analogy, there can be little doubt that the disease is transmissible from animals to mankind, and the fact would be demonstrated very speedily if experiments could be resorted to. At the above meeting, at which I was president, in alluding to this point, I made the following remarks: "A great difficulty we meet with is that, while we can experiment upon animals to prove the transmissibility of the malady from one to the other, we cannot do so with regard to the human species. Gentlemen, it has struck me that we sometimes waste human life—that we throw away very good opportunities for experiment, by the manner in which we dispose of our criminals. I think no better use could be made of those condemned to death, than by experimenting in this direction. We know that if animals be fed for a certain time with tuberculous matter, serious changes will take place in their bodies, although they may appear to be in perfect health. I do not know whether the hypersentimental people, the moralists of this country, would tolerate such a proce-

From what has been observed in human embryos and the dead bodies of new-born infants, it would appear that Tuberculosis is hereditary.

Walshe* has demonstrated that this disease, in man, has the same favourable influence in the production of sterility and abortion as in cows.

Grisolle† and Dabreuille‡ have combated the old and popular belief in the favourable influence that pregnancy should have on the development of Pulmonary Tuberculosis. If that is admitted in human medicine, it is merely supporting a fact which has been for a long time accepted in veterinary medicine.

Since the time of Galen, a great number of physicians have maintained that Tuberculosis is contagious. Among these may be cited Morton,§ who states, with regard to the causes of this malady: "*Contagium etiam hunc morbum propagat. Hic enim effectus* (*uti frequenti experientia observari*) *lecti socios miasmate quodam sicuti febris maligna, inquinat.*"

Van Swieten‖ says: "*Phthisis contagio afficit ab fœtore sputi.*"

Home mentions, among the causes of Phthisis, contagion as *causa procutarica.*

Maret has known many people succumb to Phthisis who were not at all disposed to the disease, but contracted it by wearing clothes previously worn by phthisical persons. Among others, he gives three instances which clearly show that sleeping with phthisical people may transmit the malady.¶ In consequence of this occurrence, he declared that it was dangerous to have close relations with phthisical persons, and he announced the fact publicly.

dure; but I do think that criminals who so far offend against society as to take away human life, should thus be made to atone to that society whose moral principles they have violated." Feeding, or even inoculating, such criminals with tuberculous products, in order to discover whether, after execution, these products have induced the pathological alterations noted in animals so treated, would decisively, and for ever, solve a very serious problem in the sanitary condition of mankind.—G. F.

* The *Lancet*, July, 1850, p. 5.

† "Archives Generale," January, 1850, p. 41.

‡ "Gazette des Hopitaux," 1851, No. 118. "Bulletin de l'Academie de Médecine," Vol. XVII.

§ "Opera Medicin," Lib. II., p. 36. Edib. ult. Amstelodami.

‖ "Commentaries," Lib. IV., p. 72.

¶ "Esprit des Journaux," Paris, 1779.

Other examples of transmission of the malady from man to man are given by Pothius, Schmidt, and Kruger,* and in *Hufeland's Journal.*† This is what we read on the subject: "The contagious power of Pulmonary Phthisis, which has been several times observed, has been lately confirmed in a very evident manner. A young farmer, in perfect health, received a present of shirts and clothes which had been worn by a person who died of Phthisis. He wore these articles, and in six months was dead from Phthisis." The writer adds: "How often may the unknown cause have been perhaps in the clothes or the beds used by phthisical people, and how difficult it is to discover the danger to which we are exposed in sleeping in a bed previously occupied by we know not whom (hotel or lodging-house bed)? Should it not be the duty of those who are entrusted with the sanitary service to see to the destruction of all the clothes, shirts, and beds which have been used by phthisical people in their last moments, as is prescribed by the Italian legislature? In all these cases, at least, these beds should only be used again after the flock (*duvet*) has been washed and exposed to the air for a year."

Fritzen‡ gives some instances of contagion. He says: "The very judicious observation of a great number of physicians, that Pulmonary Phthisis is contagious, has been confirmed in my long experience. A domestic inherited from his master, who died of Phthisis, several suits of clothes, among which was a vest which he wore some time afterwards, without taking the precaution of washing it. Four weeks later the early symptoms of Phthisis manifested themselves, and he died in six months. A young woman in very good health, one of a family without any history of Phthisis, was married to a phthisical man, in whose family there had been several deaths from Tuberculosis. Some years after marriage, the woman became ill and died of Phthisis. The husband, who was fifty-two years of age, again married. His second wife, who was in perfect health at the time of marriage, subsequently died of Phthisis." After relating these facts, Fritzen adds that Phthisis is more especially transmitted

* "Ephemerides Naturæ Curiosorum, decuria," I., II., III.
† Vol. VII., chap. i., pp. 34, 35.
‡ "Medic. Annalen," Vol. I., p. 231.

from husband to wife, and *vice versâ*.* He recommends the prohibition of marriage with phthisical persons, and urges that the beds and clothes which have been used by tuberculous people be cleansed and disinfected.

Cullen, who did not think the affection was contagious, nevertheless did not deny the possibility of its transmission. This is the way in which he expresses himself: "Many physicians consider Phthisis as contagious. With regard to myself, I will not affirm that it is never transmitted by contagion. Nevertheless, among a great number of phthisical people whom I have had occasion to treat during my long career, I have scarcely met with an instance in which I could invoke contagion as a cause of the disease."† At a later period he published an instance to which a celebrated physician of Groningen was an ocular witness. "A young man predisposed to Phthisis, married a young Dutch woman of a sanguine temperament and good constitution. Some days after their marriage the woman lost her fresh colour and was affected with a bad cough; a month later she discharged bloody sputa. The doctor advised her not to sleep any longer in the same bed with her husband, but she would not take this advice; in six months she died of Phthisis. The nurse who waited upon her, and the domestic who, as a measure of prudence, was seldom in the bedroom, succumbed to the same disease." Cullen adds: "In all cases, Phthisis is more quickly and certainly propagated in hot countries than elsewhere; perhaps with us (in Edinburgh), the contagious principle does not become sufficiently potent to produce its injurious effect except in fine weather, when the hectic transpiration supervenes."‡

At Rome, and in Italy generally, they are careful to conform to a police regulation which prescribes burning everything used by phthisical people.§ It was for this reason that the greatest physicians of that country, among whom may be men-

* I have known one instance in particular, in which a fine, strong, healthy man, whose wife suffered from Phthisis for some years, and died, became affected.—G. F.

† "Anfangsgrunden der praktischen Arzneiwissenschaft." Leipzig, 1870. Part II., § 553, p. 211.

‡ "Auszuge aus den best. Franz. Period." Schriften. Vol. III., p. 340.

§ *Wichmann:* "Hannoverischen Magazin." 1780.

tioned Morgani,* Valsalva, and Sarconi,† refused to make the *post-mortem* examination of phthisical persons. In that country it was even believed that in Tuberculosis, as with Leprosy among the Jews, the virulent matter was communicated through the walls of houses. Impressed with this idea, the Italians abstain, often for a whole year, from inhabiting a house in which a phthisical person has died.

In Portugal the beds and clothing of phthisical people are also destroyed.

In a work published in 1780, Dr. Wichmann, court physician at Hanover, gives, in a *résumé*, the views of many physicians and the laity as to the nature and contagious character of Phthisis a century ago. Alluding to the propagation of this affection, among other observations it is mentioned that at Zurich it is so prevalent, that one in every six cases of death is due to it. Yet the belief was that it is not so rapidly contagious, and does not so quickly alter or poison the air as the Plague, Variola, Scarlatina, or other maladies accompanied by a cutaneous eruption; though he asserts, at the same time, that the diseases which are characterised by the appearance of an exanthema or any other alteration of the surface of the skin, are not those which are capable of being transmitted by contagion. Many other affections, he adds, in which there is no eruption, may likewise be communicated by contagion, though the process is slower; contamination is less easily and less frequently effected through the medium of vehicles—that is, indirectly; transmission only occurs *when exposure to infection is frequent or long continued.*

Wichmann says, in addition, that he does not fear the objections of the orthodox, who would doubtless treat him as a heretic, because of his ideas as to the contagiousness of Phthisis. The anathemas of these persons he despised, as every observant physician might find at the bedside of his patients and in the midst of his *clientèle*, convincing proofs as to the reality of the fact he advances. He reminds those who deny the contagious-

* "De Causa et Sedibus Morborum Epist." 22-3.
† "Del Contagio del Vajuole," 1770.

ness of this malady,* that if scepticism is very useful in medicine, as well as in the other sciences, it may nevertheless lead to culpable indifference. He cites several instances of transmission of Tuberculosis between married people, and insists upon the necessity of preventing marriage with a phthisical person. As a preventive of Tuberculosis, he proposed the inspection of shops where were sold old beds or clothes which might have been used with phthisical persons, and insists on the urgency of not allowing children to cohabit with people affected with Tuberculosis.

If Wichmann's opinion has not received all the attention it deserved, neither at the time nor subsequently, the scientific experiments made eighty or a hundred years afterwards by Villemin and Koch have none the less proved its justness and reality.

The number of observations relative to the contagiousness of human Tuberculosis, especially between husband and wife, are daily accumulating to such an extent that the list of physicians who do not believe in the possibility of its transmission is progressively diminishing; while clinicians, guided by the scientific discoveries already made, recognise more readily the ways in which the tubercle virus may be transmitted. If it be true that among these ways, that which conveys it from animals to man has not been appreciated as it ought to be, its existence has, nevertheless, been sufficiently suspected to lead to the notion that there was in the bodies of tuberculous animals some principle or factor which was noxious to mankind.

We will allude in more detail to these facts in the next chapter.

In summing up the data which we have dealt with in the preceding pages, we arrive at the conclusion that all the evidence points to the fact that the Tuberculosis of mankind and that of animals is one and the same disease, which, more than any other, chooses its victims from among warm-blooded animals, irrespective of species, provided they live in agglomerations.

The following are the conclusions at which we have arrived:

1. Tuberculosis has been observed in all warm-blooded animals submitted to domesticity or deprived of their liberty.

* "Die Schwindsucht, eine Polizeiangelegenheit." Hannöverischen Magazin, Chap. 51. 1780.

2. Tuberculosis in animals and mankind presents analogous manifestations, in the living as in the dead creature.

3. The course and termination of the disease in mankind and animals is the same.

4. The masses of tubercle, and especially the sputa of the phthisical, produce Tuberculosis in animals, when these matters are introduced through the respiratory or digestive apparatus, or through a deep wound. Tuberculosis, inoculated from man to animals, may in its turn be transmitted from one animal to another, and always produces Tuberculosis.

5. Tuberculosis of man and of animals is transmitted by heredity.

6. The disease is contagious in man and animals.

7. There are clinical observations which prove the transmission of Tuberculosis from animals to man, by the consumption of the milk of phthisical animals.

8. Tuberculosis of animals and man is rare in cold climates, where it does not even appear to be developed. It is most frequent in southern countries; the tracings of the geographical propagation of the disease in man and animals are nearly parallel.

9. It is evidently proved that a pathogenic microbe, having the same morphological and biological characters, exists in the tubercle of man and in that of animals. This organism, whether it be developed in man or animals, may induce Tuberculosis, when, cultivated in a pure state, it is conveyed to the animal possessing the necessary receptivity.

When we consider that man derives a large part of his nourishment from the animals around him, we can scarcely doubt that an intimate causal correlation exists between him and them, with regard to this disease. If we carefully analyse the facts at our disposal, we shall find, concurrently with centres of Tuberculosis in animals, more or less numerous cases of Tuberculosis in man. We shall note that, for the production of the disease in the human species, it is not absolutely necessary that there should be close vicinage between mankind and diseased animals; the relations between both may be very effectively established through the indirect medium of the flesh and milk, sometimes consumed a long way from the locality in which they are produced.

The facts which we have adduced sufficiently prove the reality of this state of affairs.

As has been already said, it is more especially in dwellings containing animals exclusively destined to furnish milk or flesh, that Tuberculosis makes its ravages; and these are precisely the dwellings which supply food to towns and industrial centres. The circumspect breeder is always on the alert with regard to the animals bred and reared by himself, and he is always anxious to dispose of them whenever they show any suspicious or morbid symptoms. These animals come in contact with others, and communicate to them the germs of the transmissible diseases with which they may be affected. In this way they introduce contagious diseases into the stables of dairymen and graziers, and ultimately, after a comparatively brief interval, the animals arrive at the butcher's establishment.

When the foci of animal Tuberculosis are met with in the great centres of human populations, we need not be surprised to find in these centres a large percentage of Phthisis in mankind.

So far as we have gone, we have only examined the question as to the transmission of Tuberculosis from animals to mankind. We ought to bestow a brief glance at the probability of the communication of the disease from man to animals.

Feeders of animals and dairykeepers in the neighbourhood of towns, daily use the refuse of kitchens for feeding purposes. This particular food, which may be sometimes mixed with the excreta of mankind, may convey the morbid matter of the disease under consideration, if the refuse and "swill" is obtained from houses in which there are phthisical people. The observations gathered by some Baden veterinary surgeons, relative to the frequency of intestinal Tuberculosis in cows kept in the vicinity of towns, as well as the fact alluded to by Veith, that the droves of cattle living in a wild or semi-savage state in Hungary are exempt from Tuberculosis, are arguments in favour of this view. From what has been stated, it is established that the correlation between the Tuberculosis of man and animals is a real fact, *and that it is incumbent upon the sanitary police service*

to restrict, or even to suppress as much as possible, the operation of the causes of which this correlation is the consequence.

We cannot terminate this chapter without adding a statistical table showing the comparative propagation of human Tuberculosis and the Tuberculosis of cattle. This table is calculated on the number of 100 persons and of as many cattle, and is drawn up from the reports from the different districts in the Grand Duchy of Baden in 1881. The indications are as exact as possible, as in each commune in Baden there is an official who inspects dead persons, and receives from the medical attendant information with regard to the cause of death, etc., this information being communicated every week to the district physician. In addition, each commune has a meat inspector who keeps a register in which is entered the condition of every animal slaughtered for food, and at the end of each quarter his observations are transmitted to the district veterinary surgeon.

Besides these, the communes have in their service knackers, who are entrusted with the destruction of carcases, and are obliged to keep a register of their operations (information with regard to the number of animals and their diseases); this register is periodically inspected by the police, and is at the termination of the year sent to the veterinary surgeon of the district.

Veterinary surgeons are obliged to furnish, annually, to the Minister of the Interior a report on their professional work, in which they must mention the number of cases and the nature of the diseases they have known or been called upon to treat in the course of the year. All these reports and notices are sent to the government statistical bureau, and serve as the basis for a general report on the number of persons who have died of Tuberculosis, and of cattle which have succumbed to that malady, which have been destroyed because of it, or reported by the veterinary surgeons as being visited by them and found affected with it.

The annexed table, showing the deaths occurring in the human species from Tuberculosis, was published in the general report for the years 1880-81, issued by the Grand Ducal Minister of the Interior.

We have added the curve indicating the number of cases of

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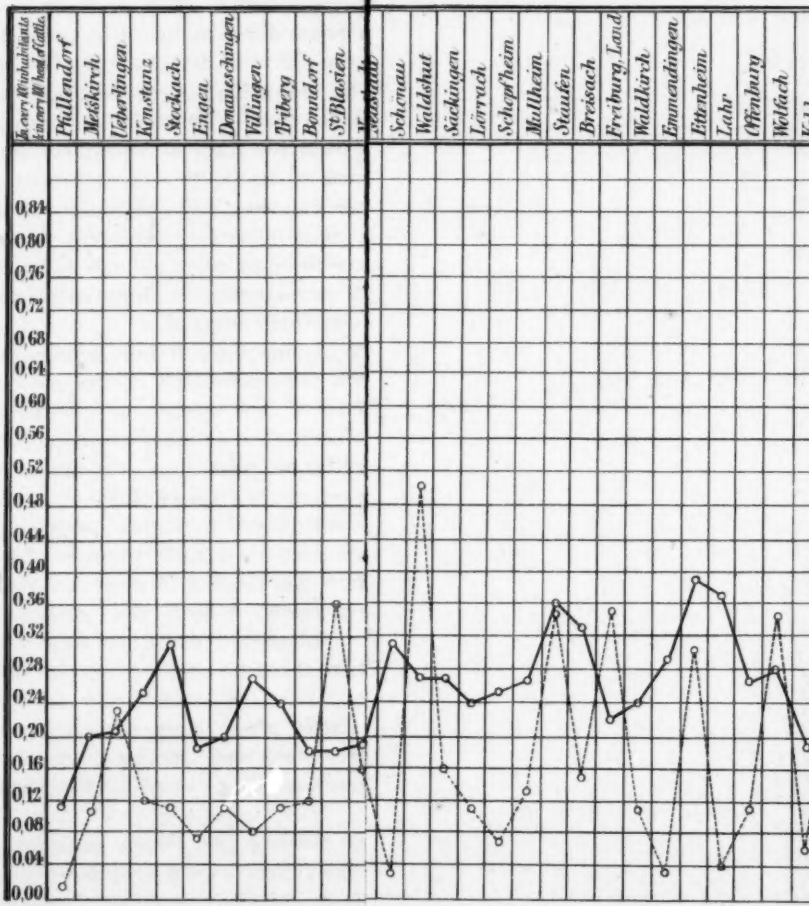
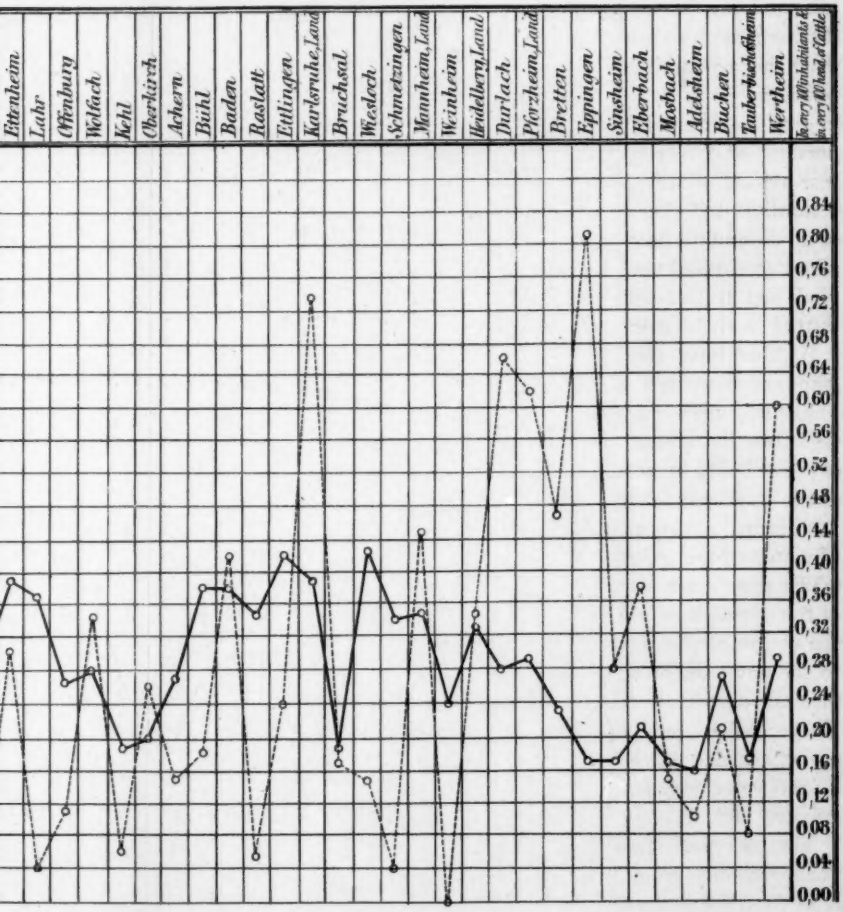
TABLE SHOWING THE DEATHS CAUSED BY
AND ALSO AMONG CATTLE IN THE DIFF
OF THE GRAND DUCHY



Inhabitants 443
Head of Cattle 129

XUM

USED BY TUBERCULOSIS AMONG THE PEOPLE,
THE DIFFERENT ADMINISTRATIVE DISTRICTS
DUCHY OF BADEN IN 1881.



Inhabitants 4434 cases = 0,28 per cent.
Head of Cattle 1231 cases = 0,22 per cent.

XUM

XUM

Tuberculosis observed among cattle in each of the districts of the country. In following the two lines, in that which marks the mortality caused by Tuberculosis in the human species, and that which indicates the frequency of the same disease among cattle, there may be remarked an approximate parallelism in the two curves, if only we omit the arrondissements of Karlsruhe, Durlach, Phorzheim, Bretten, and Eppingen, where are established many butchers who supply meat of an inferior quality to the populous centres in their neighbourhood. The town of Wertheim, in the district of the same name, exports large quantities of sausages made from flesh of inferior quality—a circumstance which readily accounts for the high number of tuberculous animals noted there. It is to be remarked that the districts of Pfullendorf, Messkirch, Stockach, Engen, Villingen, Borndorf, Neustadt, Schönau, Adelsheim, Buchen, and Tauberbischofsheim, are nearly exempt from Tuberculosis, and that very few deaths are caused by Tuberculosis in mankind. It may also be noted that breeding predominates in those districts, into which animals are rarely imported.

It must not be lost sight of, that the figures which include only one year are of little moment, and it is for this reason that we only give them outside that portion of the report which treats of the spread of Tuberculosis in general. The indications found therein seem, nevertheless, to confirm what has been said as to the causes of the propagation of the malady. It remains to be seen whether statistical researches will ultimately confirm or negative the results already obtained. These investigations are now being carried out, and it is to be hoped that they will also be undertaken in all other countries.

Third Question.

What are the Preventive Measures which should be had recourse to, in order to avert the injurious effects which may result from the use of the flesh and milk of tuberculous cattle?

Tuberculosis being a disease, the history of which ascends to emote times, the spread of which is great, and the pernicious influence of which has certainly been recognised for many ages,

the above question has very often been raised during a long period. The country whose civilisation dates from the earliest historic times, had legislative regulations with regard to food, and prohibited the use of flesh from diseased or healthy animals whenever it was considered injurious to the health of man.

In the Mosaic laws, amongst ancient legislation the best known, it is laid down concerning the disease with which we are now occupied, that the flesh of an animal, or a portion of an animal, which has been affected with general or partial Phthisis, must not be utilised as food; nevertheless, infractions of this law were not attended with corporeal punishment. If the malady had only reached the stage that the animal, though emaciated, might yet be supposed to be likely to recover, it was to be killed and its flesh allowed to be eaten.* In order to ensure the execution of the measure prescribed by the Jewish legislation, the slaughter of animals for food could only be performed by special persons, who were also entrusted with the inspection of the flesh, and decided, according to the principles laid down in the Talmud, as to the admission or refusal of this flesh for human consumption.

In the first instance, a particular mark was imprinted on the flesh,† and it only could be exposed for sale and eaten by the Jews. These ordinances are still in force with the Israelites.

According to the Mischna, the oldest part of the Talmud, and which was revised toward the end of the second century of our era, the flesh of animals whose viscera showed perforations or morbid loss of substance, was not to be consumed as food. In those portions of the work which appeared at a later period, mention is made of vegetations (tubercular neoplasms) of the viscera, and particularly of the lungs; and with regard to the last-named organs, whether the air blown into them did or did not penetrate these vegetations, also determined whether the flesh of the animal should or should not be allowed for food.

Hai Gaon, who died in 1038, states that the small vegetations (*Kandi*) are vesicular, and the larger ones (*Tinari*) are like stones (cretified phthisical nodosities).

* Leviticus, chapter xxii., verse 8; see also *Franck*, "Système d'une Police Médicale Compléte." Vol. iii., Mannheim, 1783.

† Only Jewish butchers could apply this mark.

The early Christians had, up to the third century, maintained without modification the laws of Moses with regard to food. At a later period, when the Jew-Christians, as they were called, had disappeared, these grand laws were not so scrupulously observed; nevertheless, the bishops still sat in their respective dioceses every year as judges of morality, and conformably with the prescriptions of the Old Testament, they inquired whether the flesh or blood of hunted or torn animals had been consumed as food.

Schmidt mentions the morality jurisdiction assemblies, in his "History of the Germans."*

When panzoötic diseases (Cattle Plague and Anthrax) manifested themselves in the course of the ninth century, the Franks had published to them the laws of the Church, which interdicted the consumption of the flesh of diseased animals, and, among others, that of cattle and pigs affected with Leprosy—a term which, at that time, was synonymous with Tuberculosis and Cysticercus Cellulosus. The continuation of the Roman manners and customs which preceded the Christian civilisation, may have been partly the cause of the retention of the alimentary laws. At Rome, as is well known, the superintendence of the sale of food was entrusted to four market inspectors called ædiles, who, among others, had the power to order all bad or putrid flesh to be thrown into the Tiber.

In Italy, France, and Spain, as well as in South Germany and in the region of the Danube, where Roman civilisation and manners were introduced, we also find the institution of a more or less severe *surveillance* of the trade in meat. It is mentioned, for instance, in Krunitz' "Encyclopædia of the Economic Sciences," that in Spanish towns the cattle-dealers were always, up to the end of the last century, obliged to bring their animals to the slaughter-house at a certain hour, and after slaughter the carcases of these were examined by a physician or surgeon detailed for this duty. If the flesh was found to be diseased, without any other form of procedure it was taken outside the city and buried. The inspection was gratuitous for the butcher and cattle-dealer.

At Paris, on January 30th, 1350, it was ordained that the

* Part i., p. 582.

butchers would only be permitted to sell healthy meat, and that they must conform to the law in this matter; and by a Parliamentary decree dated March 29th, 1551, butchers were rigorously prohibited, under pain of corporeal punishment, to sell, or attempt to sell, unhealthy or corrupt flesh; and they had to submit their animals to inspection by a functionary delegated with ample powers.

An ordinance of Wurtemburg, dated 1558, and the "Statuta Heinrich-Stadiensia," prescribe "that every day good flesh shall be sold by the butchers; that this flesh must not be coriaceous (*wolfbeissig*), nor from an animal suffering from Osteomalacia (*beinbrüchig*); that it be not infected with worms (*wurmig*) or maggots (*madig*), nor attacked with tubercular nor measle nodules (*finnig*); that it should be without fault or vice (*preishaftig*); that flesh not free from any of the lesions enumerated must not be mixed with healthy flesh; and that the latter must be kept separate from the former, so that it be not soiled thereby."

During and after the Thirty Years' War, bovine Tuberculosis was probably widely spread and attracted much attention; and at that time, by a fortuitous incident, it became still more interesting. This incident is thus described by Dr. Ammon:*—"In 1677, twelve students who had taken their repast in the convictorium of Leipzig, died. At the inquest it was proved that the hotel-keeper had given them, in addition to other food of a bad description, the flesh of emaciated and infected cows, whose viscera were covered with a great number of *vesicles*, of tubercular nodules (*Finnen*), and of purulent tumours. Externally, this flesh did not offer any abnormal appearance."

As a consequence of this fact, there arose different opinions as to the nature of tubercular Phthisis, and the danger of using the flesh of animals affected with this disease. Public feeling was greatly stirred by the unfortunate accident, and, exaggerating its proportions, it demanded severe protective measures.

In France, tubercular Phthisis was supposed to have some relationship to Leprosy, but in Germany it was imagined that it might be due to habits of sodomy, and that it was of a syphilitic nature. In both countries, rigorous measures were

* "Dissertation Générale sur les Matières Alimentaires." Berlin, 1775, p. 275.

adopted against the sale of the flesh of animals affected with the disease. For example, by an Act of Parliament of Paris, dated May 28th, 1716, Antoine Dubou, overseer of the Field Slaughter-houses, was condemned to make an apology in his shirt, bare head, and naked knees, a rope round his neck, a lighted wax taper weighing two pounds in his hands, and a large placard on his back and another on his chest, on which was painted: "Overseer of the butchers, who has issued to the soldiers leprous flesh from animals killed because of the disease, and who has wickedly sold and distributed the flesh of unsound cattle." Being found guilty of fraud and other crimes, he was, in addition, condemned to nine years' banishment, and for ever deprived of the privileges of a butcher, as well as made to pay a fine of five thousand pounds, one-fifth of which went to the prosecutors. A similar punishment for the same offence, was awarded in the same locality on December 11th, 1716.*

According to Graumann,† a short time after the catastrophe at Leipzig, in 1680, severe measures were enacted in Germany for the prevention of the sale of the flesh of tuberculous cattle. In consequence of these evidently excessive measures, butchers dare not have anything to do with the carcases of cattle which showed the least trace of the disease. Such carcases, and even the pole-axe which had been used to slaughter the cattle, were handed over to the public executioner.

Towards the middle of the last century, these draconic measures, which weighed so heavily on the breeder and feeder, began to be protested against. It was also reported that the executioners (*Scharfrichter*) did not bury diseased carcases, but consumed them in their own families, or sold them to third persons, without any injury or inconvenience; and it was pointed out that there was not so much severity in the butchers' share of the confiscation, inasmuch as he could recover his pole-axe by paying a fine of a thaler.

* *Tscheulin*: "Thierärztliche Polizei," 1821, p. 56.
† "Franzosenkrankheit," 1784.

(*To be continued.*)

Editorial.

RABIES.

THE recent researches of Pasteur and his colleagues, MM. Chamberland and Roux, into the nature and prevention of Rabies, are full of interest and great importance, and should the results obtained be confirmed and amplified by other observers, then there can be no doubt that a most important step will have been made in medicine, and especially in that branch of it which deals with the prevention of and protection from communicable disorders.

We have, from time to time, reviewed the work already done in this direction, and some time ago, in an article contributed to the *Nineteenth Century*, have insisted most urgently on the immense importance of the prospect opened out by the inoculation of modified or cultivated virus, as a means of affording immunity against the invasion of very serious diseases, when passed into the bodies of yet unaffected animals. It is true that we are as yet scarcely beyond the threshold of investigation into the subject, but what has already been accomplished is great, and has nearly revolutionised our views with regard to these maladies in particular, so far as their etiology and prevention are concerned.

In a paper read before the Academy of Medicine last May, Pasteur and his colleagues distinctly advance our knowledge of Rabies, and present the disease to us in something of a new light, with a strong practical tendency in addition. It is pointed out that if Rabies is transmitted from the diseased dog to the monkey, and ultimately from monkey to monkey, that at each transmission the virus attenuated in virulence; and when so attenuated, if it is passed again to the dog, or to rabbits or guinea-pigs, it remains attenuated, never returning to the virulence it possessed in the rabid street-dog. This modification can easily be brought about by passing the virus from monkey to monkey a few times, until it will no longer produce the disease in dogs by hypodermic inoculations. Even inoculation by trepanning the cranium, which is so infallible in conveying Rabies, will produce no result, and the dog, nevertheless, will be protected, and no longer capable of receiving the disease.

But, on the contrary, the rabific virus is exalted in intensity when it is passed from rabbit to rabbit, or guinea-pig to guinea-pig; and when so exalted to its maximum intensity in these creatures, it will pass in the same energetic form to the dog, and show itself much more active than that of the ordinary rabid dog. So heightened is its virulence in these conditions, that when inoculated into healthy dogs, it constantly produces the fatal disease. Although the potency of the virus is exalted in its transmission from rabbit to rabbit, or from guinea-pig to guinea-pig, it requires several transmissions through the bodies of these animals before it regains its state of maximum virulence, when it has been previously enfeebled by passing through the monkey. In the same way the virulence of the ordinary rabid dog, the virus which has not nearly

its maximum intensity, requires, when it is conveyed to the rabbit, to be passed several times through creatures of this species before it reaches its maximum.

The application of these results of experimentation, is to allow of dogs been readily rendered refractory to Rabies. For instance: Rabific virus is obtained from a rabbit which has died after inoculation by trepanation, and after a longer period of incubation by some days than the shortest period in these animals, which is invariably between seven and eight days subsequent to inoculation by trepanation with the most active virus. The virus of the rabbit, at its long incubation, is inoculated by trepanation into a second rabbit; the virus of this to a third; and at each time, these viruses, which become more and more potent, are inoculated into a dog. The latter at last becomes capable of supporting what would be to other dogs a deadly virus, and is entirely proof against Rabies, either by intravenous inoculation, by trepanation, or by the virus of the rabid street-dog.

By inoculations with the blood of rabid animals, in certain determinate conditions, Pasteur has been able to greatly simplify the operations of inoculation, and to render dogs most decidedly refractory to the malady. There is great importance attached to the suggestion, that now, and until Rabies has been extinguished altogether by inoculation, it may be possible to prevent the development of the disease after bites from rabid dogs, owing to the duration of the incubative period. Experiments have been made in this direction, and with most marked success, under the observation of Beclard, Dean of the Faculty of Medicine; Paul Bert, Professor of Physiology; Bouley, Professor of Comparative Pathology at the Museum of Natural History; Villemin, Professor of Medicine; Vulpian, Professor of Comparative and Experimental Pathology; and Tisserand, Minister of Agriculture. Fifty-nine dogs have been experimented upon, nineteen of them rabid, and thirty-eight bitten by them under uniform conditions. Of these, thirty-eight had been previously protectively inoculated, the other half not. The latter, without a single exception, died with unmistakable signs of Rabies; whereas the nineteen others are yet unaffected. They will be kept under close observation for a year, to ascertain whether the protective inoculation is permanent, or only temporary in its effects. Pasteur maintains that Rabies is produced solely by the bite of rabid animals; and if this be correct, and his inoculation afford protection, it is suggested that a law compelling all dogs to be so protected, would in the end extirpate the disease entirely, whereas if it arises spontaneously such an enactment would be less effectual.

However this may be, we will look forward with the keenest anxiety to the results which will follow the experiments now being conducted, fraught as they are with immense importance to mankind and animals.

It may be noted that Gibier has ascertained, experimentally, that birds contract the disease by inoculation through trepanation, but recover spontaneously from it

RECENT STUDIES IN BACTERIAL PATHOLOGY.

THE firmness of the hold which Bacteria, and all that relates to them, have taken on the mind of scientific investigators, says *The Lancet*, may be accurately measured by the number and length of the contributions to periodical medical literature. A grand discovery, like a huge wave, is invariably followed by a succession of smaller undulations of varying size, which are of value in their own way. If complete reliance may be placed on the conclusions of M. Pasteur's recent work on Rabies, we may indeed congratulate scientific vivisection on having achieved a position which not only conclusively establishes its *raison d'être*, but ought surely to silence the unreasonable demands of the anti-vivisection movement.

The first communication to which we draw attention is one by Osol, on the virus of Charbon, a disease which, though perhaps almost worked out, still continues to attract a large share of attention. Under the guidance of Professor Semmer, of the Veterinary School of Dorpat, Osol has studied the influence which the injection of charbon blood, deprived of its spores and bacilli by boiling, has on the animal organism. Blood taken from large-sized animals dead of charbon was first diluted with equal parts of water, boiled in glass vessels, and filtered while hot. The residue of the filtration and the coagulum formed by boiling were again treated with water, and once more boiled and filtered. After this double filtration the liquid was heated on three consecutive days for a period of two hours each time. Large injections were then made on rabbits and mice, with properly cleaned syringes. Other animals used as control subjects were inoculated with minute quantities of the charbon virus. Some sterilised broth was also inoculated with some of the reduced virus, kept in an incubating stove. Finally, the blood of the sheep and horse, taken from healthy animals, was subjected to the same manipulations as the charbon blood, and then injected in the same doses as the latter into mice and rabbits. Animals inoculated with the charbon virus previously boiled have perished in from three to six days. Their blood and glandular organs, examined immediately after death, contained in a quarter of the number of cases the bacilli characteristic of Splenic Fever. In those instances where bacilli were not detected, innumerable micrococci, like those described by MM. Semmer and Bollinger in 1872, were found. According to these observers, the rods and cocci represent two complementary morphological elements. M. Osul never came across the protococci recently described by M. Archangelski ("Contribution à l'Étude du Contage Charbonneux," Dorpat, 1884). Inoculations with the blood from animals dead of the induced disease on sterilised culture liquids led to the development of typical forms of bacillus anthracis. The same blood syringed under the skin of rabbits and mice led to the death of this second batch, bacilli being also discovered in the blood and viscera. The control animals experimented on with minute doses of the poison exhibited no pathological manifestations. The sterilised liquids remained perfectly clear, thus proving that the boiled virus contained no living organisms. From these investigations, M. Osol concludes that there exists in the blood of animals affected with charbon a specific virus, soluble in water, but non-volatile and of a chemical nature. When this virus is inoculated on animals, it modifies their liquids in such a manner that *indifferent* micro-organisms contained in the normal tissues are transformed under the influence of the virus into charbon bacilli at the end of from three to six days. M. Osol does not underrate the importance of the bacilli, which he regards as the only agents capable of producing the specific chemical poison.

M. Zahn has made fresh researches on the blood of rabbits, cats, sheep, and calves (Virchow's *Archiv*, p. 401, 1884), tending to prove that the blood of

healthy animals does not contain the germs of putrefaction. He collected, with full precautions, small quantities of blood in tubes previously filled with hydrogen, oxygen, and carbonic acid, so as to exclude the atmospheric air. After weeks and months the contents of the hermetically sealed tubes, kept at a constant temperature of 37-38° C., remained free from any sign of putrefaction.

M. Hauser (*Centralblatt für die Med. Wissensch.*, No. 21, 1884) has searched for micro-organisms in living healthy tissues. Entire organs and parts of tissues, removed, by means of instruments previously heated, from animals just killed, were at once placed in super-heated glass vessels, the mouths of which were securely plugged with cotton-wool. These vessels were then kept in a moist chamber at a temperature of about 30° C. The conclusions arrived by Hauser were to the effect that micro-organisms do not exist in healthy tissues. The bearing of Zahn's and Hauser's experiments on those of M. Osol are plain, since the last-named believes that healthy tissues do harbour germs.

Beltzow (*Centralblatt für die Med. Wissensch.*, No. 21, 1884) has examined five cases of pyæmia and one of pyosepticæmia, with a view to clearing up the nature of the germs associated with these diseases. He has found that the organs of human subjects dead of pyæmia contain, besides colonies of cocci, a considerable number of bacilli, which belong to two distinct morphological varieties. One of these has a distinct resemblance to the bacilli of malignant œdema, and the others have dimensions intermediate between the bacilli of Tuberculosis and the bacilli of the septicæmia of mice. In one case only, by the side of the cocci and bacilli, in the liver, colonies of leptothrix buccalis were discovered blocking the capillaries of the gland.

Baumgarten has given the following method for the pure cultivation of the bacilli of tubercle :—A tubercular nodule rich in bacilli, removed with due antiseptic precautions from a living animal or human cadaver, is transplanted into the anterior chamber of a rabbit's eye ; as is well known, under these circumstances, no inflammation follows. The transplanted nodule perceptibly augments in volume, and is allowed to do so for from eight to fourteen days. Microscopical examination shows that the increase in size is due chiefly to the germination of bacilli, and, at the same time, that the histological elements have undergone corresponding atrophy. If portions of this premier nodule be inserted into the anterior chamber of the eye of another rabbit, and so on for a series of rabbits, a time comes when an absolute pure culture of tubercular bacilli is obtained. The successive inoculations required by this procedure set up specific inflammatory lesions of the eye, followed by generalised Tuberculosis.

Falk has observed that putrefaction destroys the virulence of the tubercular virus. He has endeavoured to obtain by experimental means a benign Tuberculosis by inoculating virus attenuated by putrefaction, at the same time hoping to discover a means of "vaccinating" against Tuberculosis. Inoculation on rabbits with putrefying tubercular lesions was followed by a local tubercular mischief only, which ended either by suppuration or calcification, no internal lesions being discovered. But it was found that animals thus experimented on derived no immunity from fresh inoculations made with pure tubercle ; indeed, Tuberculosis seemed to ensue more rapidly.

Baumgarten has fed rabbits with milk in which tubercle bacilli had been held in suspension. After a single meal of from fifty to forty grammes of this milk, the rabbits presented, with a remarkable constancy, tubercular infiltrations of the mucous coat of the intestine, mesenteric glands, and liver. The more charged the milk was with bacilli, the more extensive was the resulting lesions. In some of these latter cases the vermiform appendix and large intestine were eaten through with caseous ulcers, on the edge of

which tubercles with epithelioid cells stuffed with Koch's bacilli were to be found. At the surface of the tonsils there also existed, in some cases, ulcerated lesions infiltrated with bacilli. Baumgarten believes that infection takes place at the upper end of the digestive track. Of other organs in these instances the lungs only exhibited tubercular lesions. This observer has also remarked that putrefaction lessens the virulence of the tubercular material.

FITZWYGRAM PRIZES.

THERE were seven competitors for these prizes at the last competition. The written part of the examination was held in London and Edinburgh on the 13th ult., and the practical and *viva voce* on the 7th inst., at Manchester, Mr. T. Hopkin, F.R.C.V.S., kindly granting the use of his establishment.

The following is the result and the number of marks obtained by each competitor, and annexed is the questions :—

NO.	WRITTEN.	PRACTICAL.	TOTAL MARKS.
15	861	630	1491
18	808	755	1563
9	808	690	1498
6	746	590	1336
4	711	625	1336
3	655	Insufficient number of marks.	
10	509	Disqualified for the practical portion of the examination.	

Result.—No. 18. .. Mr. J. E. Rickards .. 1st Prize, £50 { Both from the
„ 9. .. Mr. E. Taylor .. .. 2nd „ £30 { London School.
„ 15. .. Mr. A. J. Haslam .. 3rd „ £20 { New Vet. Coll., Edinburgh.

The examiners appointed were Mr. J. J. Meyrick, C.B., and Mr. T. Hopkin. Mr. A. W. Hill was superintendent and honorary secretary.

The following were the questions submitted :—

Anatomy.

1. Describe the courses of the metacarpal and plantar nerves, giving their relative positions with regard to the arteries, veins, tendons, and ligaments near which they pass.

2. Name the ligaments which hold together the various bones forming the stifle joint.

3. What do you cut through in the operation of castration? Describe the relative positions of the blood-vessels and the vas deferens in the part where the cord is severed.

4. Enumerate all the muscles used in the act of breathing, and state which nerves control their movements.

5. Give the origin, distribution, and functions of the 5th pair of cranial nerves.

6. Give the muscles of the larynx, and state which are affected in roaring. Describe the class of horse most subject to this affection.

7. What purpose do the valves in veins serve? In which are they most abundant, in which are they absent, and in what tissues do veins originate direct from arteries without the intervention of capillaries?

Pathology.

1. What are the causes, predisposing and exciting, of Specific Ophthalmia? Describe the changes which it produces in the structure of the eye, and state what you consider to be the best treatment.

2. Mention in detail the difference between the symptoms of Glanders and those of Nasal Gleet. How would you fix upon the exact spots for trephining, when treating the latter disease?

3. Describe the causes of Quittor, the terminations when improperly treated, and the most certain method of curing it quickly.

4. What are the symptoms during life, and the *post-mortem* appearances of Rinderpest? Describe the measures you would adopt in order to prevent it from spreading.

5. In what class of injuries are poultices or hot fomentations highly injurious, and how would you treat such injuries?

6. Describe the symptoms of a case of Rabies in the horse.

7. Describe the symptoms (underlining the pathognomonic), treatment, and terminations of a case of Pleurisy in the horse.

8. What diseases are demonstrated as being due to *micro-organisms* in the horse, cow, sheep, and pig? Give a brief description of these organisms as seen under the microscope.

Physiology.

1. Describe the difference between the circulation in the fœtus of a mammal, and in the same animal some weeks after birth.

2. Describe the minute structure of the kidneys, and name the various substances carried out of the system in the urine.

3. Detail the chief differences between the horse and ox, in the anatomical formation of their stomachs and intestines. State what is the most generally received theory of the process of rumination.

4. Describe the cilia lining the mucous membrane of the air-passages, and state what their use is believed to be.

5. Describe the structure of the liver, the composition of its secretion, and the portal circulation.

6. How is the liquor amnii secreted, and of what use is it?

7. Describe the structure of serous and mucous membranes. State what are the principal secreting membranes in the horse.

THE FELLOWSHIP DEGREE OF THE ROYAL COLLEGE OF VETERINARY SURGEONS.

AN examination for this degree was held on the 23rd June, when four candidates presented themselves, of whom Messrs. W. A. Edgar, of Dartford, R. Moore, A.D.V., and R. C. Trigger, Newcastle, Staffs, passed a successful examination.

Dr. Geo. Fleming, F.R.C.V.S., Messrs. Cox and Duguid, F.R.C.V.S., and E. Pinches, B.A., were the examiners.

The following questions formed the written portion of the examination:—

Comparative Anatomy and Physiology.

1. Describe the characters of the class Mammalia; name the Orders to which our different domestic animals belong, and give a brief outline of the characters of each Order.

2. What are the chief differences seen in the skeleton of birds as compared with mammals?

3. What is meant by the term nutrition as applied to animals? State the various functions included under that general head.

4. What is the normal temperature of our different domestic animals, and state how that temperature is maintained.

Therapeutics.

1. What is the therapeutic action of purgative medicines? State the circumstances under which their administration is indicated.
2. What is the therapeutic action of Opium? State what advantages may be gained by the subcutaneous injection of Morphia, instead of the administration of opium by the mouth.

Pathology.

1. What is the pathology of Parturient Apoplexy and Puerperal Fever?
2. What is the pathology of "Broken-Wind," and what conditions or circumstances give rise to it?
3. What are the differences between Cow-pox, Horse-pox, and Sheep-pox?

Epizootiology.

1. On what influences does the spread of Rabies depend, and what should be the measures adopted for limiting its extension?
2. Under what conditions is Glanders likely to become epizootic?

Surgery.

1. Describe the operation of Trephining:
   (*a*) The several situations on the horse's head which are available for the operation.
   (*b*) The diseased conditions which may render it advisable.
   (*c*) The method of performing it.
2. Describe Tenotomy to correct congenital deformity of the fore-leg, connected with shortening of the *flexor perforans* tendon, also describe the subsequent process of repair and elongation of the tendon.

Dietetics.

1. Give directions on suitable feeding for a foal from six weeks old, on being deprived of its dam.
2. Give a description of "Ergot," and state the effects produced on animals by food which is affected by it.

Sanitary Science.

1. Give a plan for disinfecting a stable in which there has been a case of Glanders.
2. What diseases in horses are most commonly met with after confinement in ill-drained and ill-ventilated stables?

EXAMINATIONS OF THE ROYAL COLLEGE OF VETERINARY SURGEONS.

At the meetings of the Court of Examiners of the R.C.V.S., held on the 4th and 5th July, the following students from the Royal Veterinary College were admitted members of the profession:—

Mr. H. M. Singleton...	London, N.
„ T. E. Baker	Crewkerne.
„ Henry Smith	Oxford.
„ Wm. Brookes	Pilkington, near Manchester.
„ H. C. Wilkie	Holloway.
„ R. Butler	Caledonian Road, N.

Mr. J. E. Rickards	...	...	Paddington.
„ George Stear	...	...	Ashburton, Devon.
„ A. V. Field	...	...	Huddersfield.
„ John Brett	...	...	Woodhouse, Notts.
„ J. D. Arnfield	...	...	Bury, Lancs.

The following students passed their "Second Examination" on the 7th, 8th, and 9th July, 1884 :—

Mr. J. S. Channon.
„ W. A. Collins.
„ H. B. Chambers.
„ *J. C. Coleman.
„ T. B. Arnald.
„ *G. H. Pickwell.
Mr. G. Boulton.
„ G. S. Arkcoll.
„ C. Griffith.
„ F. Eassie.
„ *G. H. Gibbings.
„ G. Goodliff.

The following students passed their "First Examination" on the 10th 11th, 12th, and 14th July, 1884 :—

Mr. G. F. Brown.
„ H. T. Reynolds.
„ J. A. Sudren.
„ *C. Cardozo.
„ †T. V. Pettifer.
„ ‡W. T. Wilson.
„ *A. Peele.
„ W. A. Dellagana.
„ †E. A. West.
„ C. A. Lye.
„ R. A. Philp.
„ *T. H. Hobson.
„ W. Rattee.
„ ‡G. P. Bond.
†Mr. W. M. Reeman.
„ T. E. W. Lewis.
„ *J. D. Roberts.
„ C. E. D. Dayns.
„ T. N. Clarke.
„ *C. H. T. Bray.
„ ‡F. Warren.
„ J. R. Bathen.
„ C. E. Williamson.
„ G. Hurford.
„ *H. M. Carter.
„ J. R. Welsby.
„ *F. J. Carey.
„ W. Stevenson.

* Marked thus passed with Credit.
† Marked thus passed with Great Credit.
‡ Marked thus passed with Very Great Credit.

Proceedings of Veterinary Medical Societies, &c.

ROYAL COLLEGE OF VETERINARY SURGEONS.

Special Meeting of Council, held June 18th, 1884.

Mr. J. D. Barford, Vice-President, in the chair.

Present :—Professors Robertson, Brown, Duguid ; Messrs. Dray, Greaves, Cartwright, Cox, Wragg, Perrins, Whittle, Blakeway, and the Secretary.

The Secretary read the notice convening the meeting.

The minutes of the last meeting were confirmed.

Letters were announced as having been received from Prof. Walley (President), Dr. Fleming, Mr. Santy, Mr. Reynolds, and Mr. Taylor, regretting their inability to attend the meeting ; and from Prof. Walley, Mr. Walters, Mr. Borthwick, Mr. Cartwright, and Mr. Walter, acknowledging the honour of their election.

Presentations to Council.

A statuette of Prof. Dick, presented by Dr. Fleming.

Journal de Médecine Vétérinaire et de Zoötechnie.

Cinerators and Sanitation, Hints on Disease of Cattle in India, presented by Mr. J. Mills.

Annual Report of the Agricultural Department of the Privy Council Office, and Statistical Tables relating to Home and Foreign Animals, presented by Prof. Brown.

On the motion of Mr. DRAY, seconded by Mr. WRAGG, a vote of thanks was passed to the respective donors.

A letter was announced from Prof. Robertson, asking that the examinations might take place either on the 3rd or 4th proximo.

The SECRETARY stated the result of the Fitzwygram Prizes Examination: Mr. J. Rickards (Royal Vet. Coll.), 1st prize of £50; Mr. E. Taylor (Royal Vet. Coll.), 2nd prize, £30; and Mr. A. J. Haslam (New Vet. Coll., Edin.), 3rd prize, £20.

A letter was announced from the Home Secretary, thanking the Council for their letter of sympathy with the Queen on the death of the Duke of Albany.

A letter from a member of the profession, exposing a case of fraud, was referred to the Registration Committee.

A letter was read from Mr. R. H. Dyer, of Limerick, stating that a practitioner had been fined or imprisoned for docking an animal, and asking if the Council would take the matter up.

The SECRETARY was directed to acknowledge the receipt of the letter, and state that the Council did not at present feel justified in interfering with the operation of the law.

The Reports from the Court of Examiners were then read.

The following Committees were appointed:

The Parliamentary Committee.

The President, Professors Brown, Robertson, Pritchard; Sir F. Fitzwygram; Dr. Fleming; Messrs. Cartledge, Greaves, Harpley, Walters, Simcocks, Simpson, Barford.

The Museum Committee.

The President, Prof. Pritchard, Prof. Axe, and Mr. Dray.

The Finance Committee.

Messrs. Cartwright, Cox, Dray, Greaves, Harpley, Taylor, Walters, Wragg, and Dr. Fleming.

The House Committee.

Professors Pritchard and Robertson; Messrs. Cox, Greaves, Harpley, Simpson, Walters, Wragg, Whittle, and Dr. Fleming.

The Registration Committee.

Professors Pritchard and Robertson; Messrs. Cartwright, Dray, Greaves, Walters, Wragg, Whittle, and Dr. Fleming.

The Library Committee.

Professors Axe and Robertson; Messrs. Blakeway, Harpley, and Dr. Fleming.

The Examination Committee.

The President, Sir. F. Fitzwygram, Professor Pritchard; Messrs. Harpley, Woods, Dr. Fleming, and the Principals of the different schools.

The By-Laws Committee.

The President, Sir F. Fitzwygram, Professors Pritchard, Robertson, Williams, McCall; Messrs. Cartledge, Cox, Greaves, Harpley, Simpson, Wragg, and Dr. Fleming.

The Dinner Committee.

Professor Pritchard; Messrs. Simpson and Wragg.

Examiner in Chemistry.

Mr. DRAY proposed the appointment of Mr. Stevens as Examiner in Chemistry, in the place of Dr. Voëlcker.

Mr. COX seconded the motion. Mr. Stevens, he said, had already acted *pro tem.* as Examiner. He had the advantage of being an examined member of the Pharmaceutical Society, as well as being a member of the Royal College of Veterinary Surgeons.

The SECRETARY read a letter from Mr. Stevens.

After some discussion, in which opinions were expressed in favour of appointing a member of the College, it was decided that Professor Voëlcker's son be requested to conduct the next examination, and that the election of a permanent Examiner should be postponed till the next quarterly meeting of the Council, notice to be given in the circular calling the meeting.

On the motion of Mr. DRAY, seconded by Mr. WHITTLE, it was agreed: "That £3,000 from the General Account of this College, and £2,000 from the College Fund Account, be placed to Deposit Account."

Mr. DRAY moved that the Secretary's salary should be increased by £50 in order that he might obtain assistance whenever he thought proper, such assistance to be paid for out of this sum. He stated that under the sanction of the President and Council the Secretary obtained assistance last year at a cost of between £40 and £50, and the previous year at a cost of £50.

Mr. COX seconded the motion.

Mr. GREAVES thought the question should be postponed until the quarterly meeting.

Professor BROWN, whilst cordially approving of the resolution, also recommended that it should be postponed till the next quarterly meeting.

The resolution was carried.

SECOND SPECIAL MEETING.

Another special meeting was then held to take into consideration the advisability of holding the next quarterly meeting at Manchester.

Mr. GREAVES, on behalf of Mr. Simcocks, proposed that the next quarterly meeting should be held at Manchester. This was an exceptional year. On the 30th and 31st July a great meeting of the National Veterinary Association would be held in that city, and it was the wish of many members of the Council that the next quarterly meeting should be held there. He was quite aware that the Charter specified that the meetings should be held in London, Westminster, or the suburbs, but he had understood it that also gave the Council power to fix the place of meeting.

Mr. WHITTLE seconded the motion, though he also was afraid that it was contrary to the Charter.

The motion was ultimately withdrawn, it being the general view that the Council had no power to meet out of London.

The meeting terminated with a vote of thanks to the Chairman (Mr. Barford, V.P.).

College Building.

The Council afterwards inspected a site in Bloomsbury Square, thought suitable for a college building.

The Secretary was instructed to obtain further particulars.

CENTRAL AND SOUTHERN COUNTIES VETERINARY MEDICAL ASSOCIATIONS.

On June 25th a meeting of the Central and also the Southern Counties Veterinary Medical Associations was held at the Town Hall at Windsor. The President, Mr. Wragg, took the chair, and there were present, Messrs. Hollingham (Hon. Sec.), of Red Hill, H. J. Hancock, A. Broad, C. Sheather; Professor Pritchard; J. Rowe, F. G. Sampson, J. B. Martin, — Barford, H. L. Simpson, and other gentlemen, whose names, unfortunately, were not obtained. Lord Arthur Somerset also honoured the meeting by attending.

Mr. Hollingham read a telegram from Dr. Fleming, regretting his inability to attend, through War Office business; he also read several letters and telegrams from other members, regretting their inability through business engagements to attend the meeting.

The minutes of the last meeting were then read by the Secretary, and confirmed.

The President then intimated that as the time at disposal was limited, and Mr. Simpson had been good enough to obtain an order to inspect the Royal farms, he would not detain them longer than to thank them very heartily for the honour they had done him in re-electing him President for the second year. He need not assure them that it would be his endeavour to further the best interests both of that Association and the profession.

The President then introduced

Professor Pritchard, who proceeded to give a most lucid and scientific lecture, containing many new ideas concerning "Curb in the Horse." He said: I shall endeavour to show that what has hitherto been taught and written thereon is somewhat incorrect; firstly, by drawing your attention to the anatomical structures involved in the disease. I shall not speak of extraordinary or complicated cases, but of "Curb" pure and simple. Curb is an enlargement of the lower part of the back of the hock, and always in the central line; this should be borne in mind, in order to avoid mistakes in the examination of hocks. The hock is made up of a number of small bones, above which are the large thigh-bones, and below the three metatarsi; those to which I wish to draw your attention are the "cuboid" and the "calcis." The ligaments of the hock are so complete, that, as an example of this, take the cuneiform bones from a horse's hock, and you will find you cannot separate the ligaments without breaking one of the bones. The one I would specially allude to is of great strength, running from the calcis to the cuboid; another ligament is the one which passes round the back of the tendons of the hock, and is called the posterior annular ligament; and passing over the bend of the hock and down the back of the limb is a tendon which we call the flexor pedis perforatus, which is held in its position and prevented from moving laterally by this annular ligament. Between this tendon and ligament we have a double layer of synovial membrane, which allows the tendon free movement. This is all the anatomy that I intend to draw your attention to.

Professor Pritchard then pointed out that the calcano-cuboid ligament was of such great strength that no action on the part of the horse would be likely to sprain it, and bring about such a condition as would result in Curb. He also said that after examining hundreds of cases, he had never seen this ligament in a state of disease.

Professor Spooner also taught that a Curb was due to a sprain of the annular ligament; this condition he (Professor Pritchard) had never seen. I also believe that you will see in print that it is due to a sprained condition of the perforatus tendon; but in the *post-mortem* inspection-room you will not find disease of this tendon at this particular part, with the exception of

flocculi of lymph on the outer side, and I cannot understand why it should become sprained here, although it may become sprained between the hock and the fetlock. There are other theories, among which may be classed disease of the cuboid. It would, however, be waste of time to attempt to refute them. I will now tell you to what I think Curb is due. I have told you that this annular ligament, under which is the synovial sheath, allows of the movement of the perforatus tendon a certain distance, and supposing a horse, in making a great leap, or a false step in travelling along a road, moved this synovial sheath a sixteenth of an inch beyond what is usual, then inflammation takes place, lymph is exuded, and that exudation produces Curb; and I think it is worth considering whether other diseases of horses' legs, which we term sprains, may not proceed from the same cause.

Professor Pritchard, after alluding to various kinds of treatment, said he had found nothing equal to the firing-iron, used in the form of the thermo-cautery.

Mr. SHEATHER: I should like to ask if there is any position in which the hock may get where Curb is more likely to be produced than in another.

Professor PRITCHARD: I do not think that there is. Under my theory the same effect would be produced whether the sprain was upwards or downwards.

Mr. SIMPSON: I must say that the theory that we have not a sprained tendon is somewhat startling. I do not know whether Professor Pritchard's theories would hold good in the case of the suspensory ligament, but I presume that the old ideas would stand here. I should like to know whether Professor Pritchard has ever given particular attention to an enlargement which occurs below the hock, and above the seat of Curb.

Mr. BARFORD said: I think the greatest compliment we can pay Professor Pritchard is to discuss the subject of his address. I have always thought that Curb is due, in a great degree, to a fluid deposition under the annular ligament in order to facilitate the friction in the action of the limb. I do not think we have laceration of fibres or anything else, but that the fluid deposited becomes organised in time, causing the bulged appearance. I also think that when we have a deposition of bone by the side of the seat of Curb, we should be extremely careful in diagnosing. Speaking of a severe case of "breakdown," I have always thought that the fibres of the tendon have been violently put to the stretch. I think Professor Pritchard's treatment is good; a remedy I have employed with success is ʒj of corrosive sublimate to ʒj of spirits of wine. This remedy ought to be used only by a professional man.

Mr. SHEATHER: I have been very pleased at this opportunity of hearing a lecture from Professor Pritchard on this subject. I had accepted what has been taught in our text-books as the true pathology of Curb. In one case which I examined after death, that of an animal which had suffered from Curb, I found a gelatinous, blood-coloured matter, scarcely set, which we should scarcely expect from a sprain of a large ligament. I have seen horses go back to work in three days after being lame with Curb, without any treatment at all, and they have never had a recurrence of the attack. How could this be, if the position of the os calcis depended upon this ligament keeping in its place? As to sprains of the posterior annular ligament, I am almost certain that what Professor Pritchard says is correct. I think that ligaments are sprained seldomer than is generally supposed. As regards treatment, that mentioned by Professor Pritchard is no doubt the best. I have used the instrument he mentions, and I find that you get the best effect without blemishing the animal to any degree. All methods which favour absorption seem to be the right ones to use at first. Mr. Barford has mentioned corrosive sublimate. This should be used with caution. I think that the strength as mentioned by Mr. Barford is quite enough. I should like to ask the question whether there is any one position in which the hock may be placed in which

Curb is more likely to be produced than another. I think that the sudden reining back of a horse is more likely to produce a Curb than the reverse action of the extension of the tendon. Mr. Sheather then mentioned a case where he had every reason to believe that Curb was formed by a horse landing from a leap.

Mr. SIMPSON alluded to the enlargement sometimes found at the heel of a horse after the operation of neurotomy, which, he thought, might be due to the laceration of the synovial membrane in the heel, and Professor Pritchard's theory would support this. He also quite agreed with Professor Pritchard as to the advantages of the thermo-cautery over the ordinary iron.

Mr. MARTIN thought that Professor Pritchard's opinion would do good by leading to further investigation. Having had, as he said, opportunities of examining hundreds of cases of Curb, Professor Pritchard was in a good position to judge; but as horses are generally worked for years with Curbs, veterinary surgeons are not able to obtain the requisite anatomical knowledge. He believed Curbs are, to a great extent, hereditary. Mr. Martin then alluded to cases which had come under his notice in support of this opinion.

Mr. SAMPSON: I think that Curbs are probably due to an increase in the quantity of the synovial fluid, as we have many cases that do not produce lameness, which would be the case if a tendon was sprained.

Lord ARTHUR SOMERSET said: I have had a good deal of practical experience with Curbs, and have found that fomentations until the heat has been taken out of the Curb, and then application of equal parts of spirits of wine and spirits of ammonia to be very effectual, without any other treatment.

Mr. WRAGG: I was taught by Professor Spooner that Curb was due to sprain of the annular ligament, and since then I have not taken the trouble to investigate the disease much. Professor Pritchard's theory is quite new to me, and I think I may adopt it. I should like to hear something said about the kind of hocks most predisposed to Curb. I think we are much indebted to Professor Pritchard for giving us such an able address.

Mr. SHEATHER: I have principally had experience with half-bred horses, and have not paid much attention to the kind of hock most liable to Curb. A horse with a sickle hock, or a short os calcis, would, however, be likely to have Curb.

Mr. HOLLINGHAM: My experience in this matter has, perhaps, been more limited than that of many other gentlemen present; but the majority of cases that have come under my notice have been in what we should call good-shaped hocks, perhaps because they have been subjected to more exertion. Where time has been a great object I have succeeded in removing Curb lameness by applying cold water with a pipe two or three times a day, for about a quarter of an hour each time; if the lameness recurs I have then, without loss of time, had recourse to other and more severe measures.

Professor PRITCHARD: The sprained condition of the tendon, and the enlargement above the seat of Curb, immediately under the cap of the hock, alluded to by Mr. Simpson, is due to a dropsical condition of the bursa. In reply to Mr. Barford, as to the fluid thrown out causing the bulge, I am rather inclined to differ from him. I think that in a *post-mortem* examination you would find blood mixed with lymph thrown out into the sheath. It becomes organic, and if you could examine the same Curb three months afterwards you would find a partially solid mass. I have noticed that however much a horse recovers from Curb he never regains his beautiful inflexion of the hock. With reference to Mr. Barford's remarks as to the use of corrosive sublimate, I have known it bring about recovery. I agree with Mr. Sheather that a Curb occurs more frequently from extreme flexion of the hock

than from extreme extension. Any movement of the horse which stretches the synovial sheath beyond its limits will produce Curb. As to Curbs being hereditary, this is an old bone of contention. I do not believe Curb is hereditary, though the form of the limb may be so. A Curb in a well-shaped hock is not the rule. Lord Arthur Somerset has alluded to a simple line of treatment which he has found efficacious. If the veterinary surgeon were to adhere to this method, his patients would scarcely recover quickly enough to satisfy his clients.

Mr. SHEATHER then proposed a vote of thanks to Professor Pritchard for his kindness in coming so far to enlighten them.

Mr. SAMPSON seconded, and the motion was unanimously carried.

Professor PRITCHARD, in reply, said: I thank you very much for so kindly recognising my efforts to add a little to the knowledge of the veterinary surgeon. If I have only awakened in your minds something which will lead to further investigation, I shall think that I am amply repaid.

A vote of thanks was then, on the motion of Mr. BARFORD, seconded by Mr. SIMPSON, unanimously accorded to the Chairman.

Mr. WRAGG having briefly acknowledged the compliment,

Mr. BARFORD said: As a member of the Southern Counties Association, I am sure I may say that we all appreciate the honour conferred upon us by Lord Arthur Somerset, in coming among us to listen to a discussion in connection with the horse; especially when we consider that the noble Lord is a member of one of the best sporting families in this country, and that he has taken the deepest interest in the welfare of the profession to which we belong.

Lord ARTHUR SOMERSET said: I had no idea when I came to this meeting that any mention would be made of my name; I merely came to listen to the lecture. It will always be a matter of the highest interest to me to do what I can to further the interests of the veterinary profession.

The members then, through the kindness of Mr. Simpson, who obtained the requisite order, were enabled to visit her Majesty's Model Farms on the Windsor estate, and after spending a pleasant afternoon, dined together at the Castle Hotel.

E. A. HOLLINGHAM, *Hon. Sec.*

THE BORDER COUNTIES VETERINARY MEDICAL SOCIETY

A MEETING of the above society was held on the 6th of June at the Bush Hotel, Carlisle, the President, Mr. Carlisle, in the chair.

The following members were present: Messrs. Joseph Carlisle, Carlisle; H. Thompson, Aspatria; J. M. Watson, Ireby; J. Pears, Penrith; R. Roberts, Kendal; W. C. Crowdace, Haltwhistle; Wm. Summers, Allendale; John F. Thompson, Aspatria; Jas. G. Bell, Carlisle; Jacob Dawson, Carlisle; Thomas Coates, Brampton; J. Lawson, Keswick; J. Young, Cockermouth; J. Soulsby, Whitehaven; J. Donald, Wigton.

The visitors included Professors Williams and Lewis, Edinburgh; Mr. J. Twentyman, Blenerhasset Farm; Mr. Pattinson Hayton, Carlisle; and Mr. Warwick, Hutton Ends.

The CHAIRMAN opened the proceedings by calling upon the Secretary to read the minutes of the preceding meeting.

Mr. JAS. G. BELL nominated Mr. Howe, Keswick; and Mr. THOMPSON nominated Mr. John Bell, Clonmel, as members of the Society.

The SECRETARY next read letters of apology for non-attendance from the following gentlemen:—Messrs. A. J. Mc.Intosh, Dumfries; R. Rutherford, Edinburgh; Jacob Howe, Keswick; Thomas Greaves, Manchester; T. D. Anderson, Wigton; Henry Pears, Langholm; James Clough, Whitehaven;

James Chalmers, Longtown; Joseph Robson, Penrith, and Professor Walley, Edinburgh.

On the motion of Mr. THOMPSON, Aspatria, Professors Williams and Lewis were elected honorary members of the Society.

The SECRETARY stated that he had received the following notice of motion from Mr. Dawson :—"That it is desirable that the representatives of the lay press be excluded from our meetings, and that all reports thereof emanate from the Secretary direct."

The SECRETARY called attention to the fact that Mr. Christopher Chambers, near Silloth, had been suing for attendance in the Wigton County Court. Mr. Chambers was not a veterinary surgeon, and it would be well that he should be informed that his acting as one was subject to a penalty. He believed the case had been submitted to arbitration. It was agreed that Mr. Chambers be cautioned.

The SECRETARY advised members to see that their names were correctly entered in the register of veterinary surgeons, pointing out one or two omissions.

Mr. THOMPSON proceeded to read his paper on

"*Hoose and Diarrhœa in Stirks, prefaced by some remarks on Foot-and-mouth Disease, and Germic Diseases in general.*"

Some twenty-four years ago, on my first settling down at Aspatria, I remember being on one occasion in the farm-yard at Brayton Hall, when the late Sir Wilfrid Lawson entered into conversation with me, in the course of which he alluded to my recent commencement of practice. He expressed his good wishes for my success, adding that he thought there was plenty of room for a professional man in the district.

During the interview he referred to the large number of deaths annually taking place amongst his young cattle, and urged me to look around and endeavour to introduce some rational measures as preventatives, in the way of better sanitary arrangements, which would tend to save the lives of the young animals, and as near as I can remember he said :—

"If this could be accomplished by any system of improved sanitation, it would be a great boon to the whole farming community, as I consider the saving of the lives of the young animals somewhat analogous to the old adage in connection with saving money, 'Take care of the pence and the pounds will take care of themselves,' and so it would be in farming stock, if farmers took care of the calves and stirks, the older animals might be allowed to take care of themselves."

He also alluded to the numerous losses arising from calves dying from what is commonly called "White Scour" or "Diarrhœa," enlarged joints, or what is still vulgarly named "Joint Fellon," also from inflammation of the umbilical cord, or that which is known as "Navel-ill," as well as Hoose or cough. The remarks made by the late baronet I have never forgotten; they were the first which led me to think of preventive measures for some of the diseases in cattle, and especially their young, over which we have very little control with medical treatment, as we are generally consulted when too late, but, by giving attention to the prevention of the maladies, I do most decidedly think that we, as veterinary surgeons, would raise the status of the profession considerably above what it has ever yet attained.

It is an old but true saying that "Prevention is better than cure," and if we could by any means devise methods whereby we could prevent some of the maladies which make such ravages and cause such heavy losses in our valuable flocks and herds, how much better would it be than endeavouring to cure them after the disease has been allowed to develop itself.

In my opinion, a large number of the complaints to which cattle are subject would be considerably reduced, if the breeders and feeders would turn

their attention to a better system of farm sanitation, and I feel certain if sanitary measures were enforced, our annual losses would not be nearly so heavy as they are at present. Look at the appalling loss yearly sustained by Rot or Liver-Fluke, Braxy and Louping-ill, in sheep alone, ailments indigenous to our country, and which might be prevented if the Government would look to and take up energetic measures, in the same manner as they do at present with what they happily call "foreign or imported diseases." If, with the help of men like Drs. Burdon Sanderson, Bastian, Professors Tyndall, Pasteur, Koch, and others, who have devoted their time and talents to the discovery of germic diseases—diseases which are due to small organisms in the system; if we could demonstrate as a certainty that Foot-and-Mouth disease, lately so prevalent, was due to small germic bodies in the blood; if we could also discover under what peculiar circumstances and conditions these organisms take up their abode in the animals and multiply and produce the disease, and by these means be enabled to prevent it, how much better it would be than to have to suffer from the unpleasant, unsatisfactory, and expensive regulations which cause such a dead-lock to the cattle trade of this country. In former years, when there were no restrictions, and the disease was allowed to have its full swing, immediately it made its appearance, it was not unusual to have all the cattle brought in contact with each other, so that the disease might the sooner run its course, which it invariably did, and died out in a considerably shorter space of time than it appears to do at the present day.

Generally speaking, epidemics and epizootics are more virulent at their first outbreak than in their later stages, proving beyond doubt that the morbid material, germs, or spores, which cause the disease to become modified or attenuated and lose their extreme virulence, by passing through the bodies of so many different animals, and gradually assume a milder form until the diseases disappear. If this were not so, every severe epidemic would have a tendency towards total extermination. Relaxed systems with feeble vitality, and weak constitutions with fine organization, are the subjects most suited for the development and multiplication of micro-organisms, and, from accounts, Pasteur has by repeated propagations or generations succeeded in so modifying the bacilli of several fatal diseases, that they not only become quite harmless, but also act as a preventative by inoculating healthy animals with these attenuated preparations.

Formerly, when the disease was rife, very little was thought about it, and veterinary aid was scarcely ever required; and why there should be such a commotion in the country when it happens to break out now, I am utterly at a loss to understand, seeing that very few deaths take place. From the general tone of the country over which I travel, both amongst farmers, cattle-dealers, and others, there is but one opinion on the subject, and that is that the restrictions as to the removal of animals have done more injury and caused more loss, in a commercial point of view, than ever the disease did in its most virulent form. Whenever I have asked farmers, traders, and feeders, if they could buy store cattle affected with Foot-and-mouth Disease at 10s. or 20s. per head less than non-affected animals, would they run the risk? all have replied that they would risk the transaction as they had done before when there were no restrictions. What did the restrictions do for the cattle and sheep-feeders last winter? Why, they caused stocks to be purchased at such high figures, that when they were ready for the butcher, after wintering on cake, corn, turnips, etc., the animals failed to bring the prices paid for them at the previous back end; who has to recompense the farmer for this loss? Must he look to the Government or landlord? Where do his rent and taxes come from when he is losing on both horn and corn? As the finest dressed wheat is now making only about half the price it did a few years ago, it is quite certain that the real practical men, who are the meat-producers, are not at all

in favour of these rigid restrictions; we, therefore, can only assume that they must have their origin and enforcement with fancy breeders, who can afford to give £500 to £1000 for a single animal.

Certainly, it causes in many instances a great pecuniary loss to individuals, when in-calf cows are attacked, resulting in casting their calves, loss of milk, and death of the young animals; but this, in my opinion, can be modified or prevented to a great extent. Sheep also suffer very much from this disease, and so do young pigs. But individuals must, and have had always, to give way to the majority.

The origin of this disease sometimes appears veiled in mystery. I remember, some years ago, a friend of mine, Mr. George Tordiff, Wolsty-Stangs, bought some cattle from a neighbouring farmer. A few months after Foot-and-mouth Disease broke out in his farm buildings, and all the animals, cattle, sheep, and pigs, etc., were affected more or less with the complaint. Strange as it may appear, Mr. Tordiff had not bought a single animal from any other person between the time of purchasing these animals from his neighbour and the commencement of the complaint; and what is more striking still, there was not, to my knowledge, another case of Foot-and-mouth Disease in either Cumberland or Westmoreland at that time; nor had any of his friends or neighbours a single case, and the disease died out on the premises without spreading any further. Yet at this time there were none of the stringent regulations as to the removal of cattle, nor yet a cordon of police to guard the infected area. Again, a few months afterwards, a black cow commenced with a disease of the left lung which ended in Pleuro-pneumonia, and Mr. Tordiff unfortunately had to slaughter the largest portion of his valuable stock. One of the cows at the time of attack was suckling two calves, the cow was put down, but the calves lived and did well, never showing the least symptoms of the disease. No other outbreaks followed these on Mr. Tordiff's farm, though I attended the animals through both diseases twice and three times a week, and passed to and fro amongst other stock without any serious consequences arising therefrom.

Mr. Thomas Watson, of Hayton, informs me that when he lived at Ireby, he bought a cow from one of his neighbours; two months after it commenced with Foot-and-mouth Disease, and all his stock suffered more or less, with the exception of twelve bullocks in a byre adjoining the box, and only separated by a thin partition from the cow that first commenced. Nor had he purchased any other animal in the interval; the disease extended no further, nor was there any other case Mr. Watson was aware of in the county. Again, some time ago, Hy. Railton, Esq., Snittlegart, bought about a score of cattle at Cockermouth market, which had been exhibited at Carlisle two days previously, and no doubt but they would have been inspected there. Two of his friends looked at the animals before Mr. Railton purchased them; they were then sent home and driven along a road through two parcels of land occupied by some of his neighbours, wherein cattle and sheep were grazing; next day the recently purchased animals were found to be suffering from Foot-and-mouth Disease, but it confined itself to these animals, and spread no further, neither did any of the animals depasturing in the fields through which the cattle had passed the previous day become infected, nor did four cows suffer that were following on the road from Cockermouth immediately behind Mr. Railton's cattle.

Again, the last time the complaint attacked the cattle at Brayton Hall, there were nearly 200 head in the parks. The object in bringing them all together was to let all take the disease as soon as possible, and to get through it, when only about ninety-eight animals became affected. This, to my mind, proves pretty clearly that the germs become modified or attenuated by passing through so many different subjects, and thereby lose their virulence,

which goes to prove, to a great extent, the experiments of Pasteur, as he has succeeded in developing from a vegetable spore or germ, by cultivating hay tea bacilli in animal soups, and generating it into the malignant germ of Anthrax, which destroys so many sheep on the Continent. After passing through the bodies of living animals, he has recultivated the germ, so as to rob it of its virulent action, thus showing that from these small vegetable organisms, which are floating in our midst unperceived by the naked eye, under certain conditions and circumstances, are undergoing continual change, and some ever ready for attacking the animal kingdom with epizootic and epidemic diseases whenever a favourable opportunity and a suitable subject offers itself, and again to become modified or attenuated by passing through the bodies of a number of living subjects. This is well exemplified in every-day life. We all know that by careful cultivation we can develop from the wild oat grass a perfect oat, while, on the other hand, a perfectly-developed oat, if left to its natural resources and uncared for, will degenerate back again to the common oat grass. The same law holds good for the parsnip and every other vegetable; and so we find it in the animal kingdom, or why change our male animals? for we know too well that in-and-in breeding tends to degeneracy and disease. Then why there should be such a cry out immediately a case of Foot-and-mouth Disease is reported, and such stringent official restrictions and red-tapeism enforced, I cannot tell—making a great fuss over the symptoms, but leaving the cause to have its effect; and if by the restrictions so rigidly enforced we keep Foot-and-mouth Disease lingering in our midst, preventing it from running its course and dying out, we do a great injustice to private individuals, as well as to the whole community.

Whenever we have a case of Cholera, Typhoid Fever, or Scarlatina in the human subject, it can generally be traced to some defective drainage or bad sanitary arrangement; but these subjects are now well under the control of the medical profession, and not left to conjecture, or in the hands of unscientific men, and it is very humiliating to veterinary surgeons to have these matters taken almost out of their hands, and only allowed to play second fiddle.

I am inclined to think, that in many instances these so-called imported diseases are mainly due to the exhaustive effects of the means used in the transmission of cattle from other countries to this one. For instance, take Ireland. Cattle may have to be driven a number of miles before being placed on the railway, to be carried a long distance, more particularly in the early spring months, and, perhaps, have just left their warm byres or cabins, and, therefore, are quite unprepared for a long, cold journey. They are then put on ship-board, closely huddled together, and on reaching our shores after, perhaps, a rough passage, they are again retrucked, and sent onwards, and arriving at some market town, are exposed for sale; the purchasers then take them forward, perhaps another ten or thirty miles by rail or road, and all this while with little or no food. Having arrived at their fixed destination, the owner, for fear they should be affected with disease, has them housed into, perhaps, a damp, badly-ventilated place, or turned into the open field, and probably all this is being done during the most inclement weather. Is it, then, any wonder that the systems of the animals become so relaxed and enfeebled as to present the most favourable conditions for the development of these epizootic diseases? and as it is now generally thought these maladies are in a great meaure due to small germs developing and propagating in the body, for it is a well-known fact that the air we breathe is teeming with germs of life, as well as the water we drink, which only require suitable circumstances and conditions, where they can find a bed and proper pabulum for their development, I therefore think there is ample room for further research, and the introduction of preventative measures.

At every port of debarkation in this country there ought to be provided large quarantine depôts, where the animals, on their arrival, could be properly sheltered and attended to until the relaxation and exhaustion, brought about by the sea voyage, had passed away, and as soon as they had attained sufficient tone of system, they could be allowed to proceed on their journey. The regulations of the depôt should be under Government rule, and properly qualified attendants to look after them, and see that the animals were well-cared for, the expenses entailed by these arrangements to be defrayed by the importers. These regulations would, I think, greatly tend to minimise the so-called "foreign diseases" arising from cattle being imported into this country, and the seller would gain more per head for the animals, which would cover the cost, and the purchaser would buy with greater confidence.

But, Mr. President, I think I am transgressing. At the last, and I might say, the first meeting of our Society, I promised to read a paper on "Hoose and Diarrhœa in young cattle," and as these two complaints arise from somewhat similar causes, I have therefore coupled them together.

With reference to the former complaint, it should be understood that I allude to the Hoose which is so common amongst young cattle at the back end of the year, and which, you are all aware, is caused by the presence of small thread-worms, known as strongles, infesting the trachea or wind-pipe, and bronchial tubes, generally most prevalent in September and October, more particularly so in wet seasons, on strong clays or retentive soils, where water is seen in small pools; in fact, on any land that is soppy and wet. Such conditions always favour the complaint. There seems to be a great difference of opinion as to how the worms in such large numbers as are found on *post mortems*, gain their habitat. My friend, Mr. A. S. Moffat, of Newcastle, an eminent microscopist, informs me that while examining a strongle, taken from the lungs of a sheep, under a single microscope, he was not a little surprised to see the posterior half of the body split open longitudinally, and a large number of young—in every way the fac-simile of the parent—roll out into the water on the slide. They all seemed fully formed and ready for their work, thus showing that the parasite is ovoviviparous, hatching its young within its own body, and not depositing eggs. This, I think, accounts for the large number of the parasites being found so early after the commencement of the complaint in the trachea and bronchial tubes; but how they gain their admittance at first, as already stated, I am at a loss to understand. I trust, however, that from the discussion which I expect to follow, with the microscopic illustrations by Professor Williams, we may arrive at a satisfactory conclusion as to how they do so.

My view is that the small strongles, which have been hatched in the bronchial tubes, might have been coughed up by previously affected animals on to the grazing pastures, or left on the ground in the fæces of such animals, and in wet weather or dewy nights—as they require moisture for their existence—attach themselves to the muzzles of the calves, and insidiously find their way up the nostril into the trachea, their proper habitat, whilst the calves are in a sleepy condition, induced by the sedative effects of the cold ground, when lying down at night with their head and neck outstretched, as we frequently see them.

These parasites, after becoming fully matured, split open and liberate numerous smaller worms, which have been developed within their body; and thus, two or three strongles are quite sufficient to account for the large number frequently found in the wind-pipe. Be this as it may, my practical experience has always pointed to this fact, that—

CALVES AFFECTED WITH THIS COMPLAINT are those which have been

turned out to grass and left out over night, more particularly in wet autumn weather. I have also found an occasional case, where the animals have been turned out during the day and brought in at night; but the generality of the cases are amongst animals left out in the field all night, or till a late hour after the sun has gone down. Where the young animals are kept in-doors, and never turned out to graze until they are a year old, they are seldom or never affected with this troublesome pest; therefore the preventive measures are very simple indeed. It is only necessary to keep them indoors till they are twelve months old, and have them well supplied with plain good food and dry beds. As for the symptoms and treatment, I think it would be superfluous for me to deal with this, as this paper is intended to treat more with the prevention than with the cure of disease; however, I have been fairly successful in treating the complaint with a balsamic terebinthian preparation, combined with good nursing and judicious feeding. I may also state, in passing, that I could quote numerous instances, not only in my own district, but in many other parts of the country, where the affection which was very prevalent, has been entirely eradicated by dressing the land with crushed rock-salt in the early spring months, at the rate of from 5 cwts. to 6 cwts. per acre, even when the young animals have been turned out during the day, and left out till a late hour at night.

I may here mention, that during the past summer I had a number of cases of Hoose in grown-up cattle, where the symptoms were in every way characteristic of Pleuro-pneumonia, and on auscultation of the lungs of several of the affected animals there was heard the well-known sound, as in the second stage of Pleuro. I attributed the cause to the herbage, which contained a large quantity of what is known as white-topped grass, or "*Agrostis vulgaris*," common or brown bent grass, a worthless species, and which I have on former occasions had every reason to believe was is some way connected with the very troublesome coughs in cattle during August and September; and I am inclined to think that some small insect deposits its eggs on this grass, which irritates the respiratory organs of the cattle feeding thereon, for on removing them to a fresh and better pasturage, the coughs have always disappeared. I now come to the most important part of my paper,—

DIARRHŒA, a subject which our friend, Mr. Harrison, auctioneer, of Carlisle, introduced at our last meeting, by asking if anything could be done in the way of preventing so many young stirks suffering from Scour, as during the last few months he had seen more young animals affected with this complaint than he had ever remembered during the whole of his experience.

This disease has been the bane of the veterinary profession for years. By its ravages, hundreds of young animals are annually destroyed, and from reports, it has been more rife during the last winter than for many years, and I attribute this increase of the malady to the large rainfall we have had of late.

Diarrhœa may arise from various causes, but I shall confine my remarks principally to that which attacks young stirks ranging from six months to two years of age. I remember, when I first commenced practice at Aspatria, the disease was very prevalent in the surrounding district. For five successive years, the whole of the young stock on the Allerby Hall estate succumbed to the complaint—during the three years previous, and the two years following my settling in Aspatria. Every imaginable kind of treatment was tried, but without effect. In the *post-mortems*, I invariably found the biliary ducts of the liver completely filled with fluke-worms, the liver disorganised, and the gall-bladder enlarged. I also observed at the time, that young animals which were kept indoors, and not turned out to graze, never suffered from the disease. This, so far, was something gained. The next point was what was the cause of the complaint? and how did the fluke-worm get into the liver?

Seeing that Professor Thomas, of the Oxford University, has lately conducted an extensive and exhaustive investigation of the natural history of the Fluke-worm—the great cause of Rot in sheep, and in the majority of cases of Diarrhœa or Scour in young cattle—with which, I presume, you will all be more or less conversant, it will be quite unnecessary for me to enter into the habits and nature of this little pest.

First, then, as to the cause of the disease. Various theories have been advanced. Some attribute it to the parents, as a hereditary disease; but that cannot really be the cause, as we frequently see the parents living, and in apparently good health, long after their progeny have been carried off by this scourge. Others say it arises from irritation of the bowels; and in many cases this is correct, the irritation being due to some foreign body lodged in and causing irritability of the lining membrane of the intestines, the effects of which are soon seen.

Again, animals from two or three years of age suffer from Diarrhœa, owing to the irritation set up in the mucous membrane of the alimentary canal, by the shells of the milk teeth not having been cast at the proper time. But when these are removed, the animal generally does well. By others, the disease has been attributed to the presence of small strongles, which have been picked up and become embedded in the mucous membrane of the intestines, when the animals have been at grass during the latter part of summer. But in all my *post-mortems* I have never been able to find the disease to arise from this cause. Then, again, we have it arising from the derangement of the liver, and this from two different and totally distinct causes. First, from the presence of the fluke-worm, as already referred to, which develop themselves in the bile-ducts of the liver, and second, from the complete structural change of the liver into what is known as fatty degeneration. By the aid of the microscope you will have ocular demonstration of the sound structure the liver ought to present in its healthy condition, and also of the changes which it undergoes in the process of fatty degeneration. As already stated, the disease is most prevalent amongst young animals that have been turned out to grass before they are a year old, more especially about the harvest months. In the early part of summer, when the grass is fresh and succulent, the calves are usually kept indoors, and have a good supply of milk; but as the season advances, when the grasses are getting rough, seedy, woody, and dry, and when insect pests are depositing their eggs for winter shelter, the supply of milk scarce, and the young animals requiring more food, the farmers are busy with their harvest operations, and are tempted to turn their fine, young, healthy-looking calves into the pastures, and by these means they come into contact with the germs, which, in time, give rise to the presence of flukes in the bile-ducts. As August and September are the two most fatal months, both for sheep and cattle taking into their systems the pupæ of the liver-fluke, and which is now generally thought to be secreted in the stalk, and under the cuticle or skin of the stems of grasses, growing in damp and soppy situations. This I have found to be the principal cause of so many young stirks suffering from this baneful malady, and as a preventative, I have recommended all young calves to be kept indoors until they were twelve months old, and the pastures dressed with 6 to 10 cwt. of rough crushed rock-salt to the acre in spring, and wherever the advice has been acted upon, the disease has almost entirely disappeared. I have only seen an occasional case in my district during the last sixteen years.

But I am sorry to say that since I promised to read this paper, I have seen several cases at two different places—one, a lot of six stirks, two of which recovered and four died, and on *post-mortem* examination, the bile-ducts of the livers were found to contain large quantities of flukes. The

cause was attributed to the young animals having grazed the previous summer on some strong, wet land. The second, a lot of eight fine young shorthorn heifers, one, two, and three years old, the symptoms resembling those animals affected with flukes; but on careful *post-mortems* and microscopic examinations, the disease proved to be due to fatty degeneration of the liver, and portions of such livers are now under the microscope on the table for your observation, and perplexing me in no small measure to find the cause. I knew the animals had been well cared for, having a good supply of the most nutritive feeding materials in the shape of cake and corn, but during summer they had also been turned out to graze, which I thought was quite sufficient to account for the excessive Diarrhœa, although the land was dry, sound, and good, on which they had been pasturing. All were doing well, and in first class condition till between Martinmas and Christmas, when their coats were noticed to lose their fine healthy bloom, and clapped close to the skin, which was tight on the ribs; the sides became flattened, appetite lost, body pinched and wasted with excessive Diarrhœa. On my visiting them, I was very much astonished to find them scouring. Knowing how they were well fed and attended to, I felt confident the animals had accidentally got into some unsound land and contracted the fluke, but this idea was strongly opposed by the owner. On the death of the second animal a different state of things was revealed from that we find when the animals die from the presence of flukes in the liver, for instead of the pale, emaciated body, both of flesh and fat, this one contained large quantities of fat on the inside of the belly, intestines, and ribs. The kidneys were also well covered, but the liver was of a peculiar light brick colour; very small and rounded at the edges, and so brittle that, on lifting it up, it could not support its own weight. The gall bladder was enlarged and thickened, and the muscles or flesh in a wasted condition.

Naturally this caused me no small amount of anxiety as to what could be the cause of this peculiar change in the structure of the liver of such young animals as only the heifers, which, as already stated, were of the fine shorthorn breed, were affected thus, while the bullocks of the same age and under the same premises and system of feeding were not affected.

A short time before the complaint showed itself the animals had a change of food, in the shape of a compound cake which contained a very large percentage of fat-forming matters, about 65 per cent., such as starch, sugars, etc., while the albuminoids, or flesh-formers, were very low, only about 12 per cent.; and it is quite possible that the superabundance of fat-forming materials might be taken up by the lacteals and carried by the portal system direct to the liver, and thereby have something to do in setting up the change in the structure of that organ, as the animals were in great condition prior to the compound food being given to them; however, our friend, Professor Williams, will favour us with his views on the subject with a microscopic demonstration of the structural change into fatty degeneration.

I am not prepared to say that this peculiar change in the liver is a very common cause of this troublesome and generally fatal diarrhœa, nor yet am I prepared to say it is not so. Although numerous opportunities are offered for making *post-mortems*, we too seldom avail ourselves of them to ascertain the facts, and it is quite possible that when young calves are well cared for in the early part of their lives, and then turned out to graze, the acid elements of the grasses may act in a somewhat similar manner as do the elements of the starch and sugar, seeing that all of them are compounds of C, H, and O, and thus set up a kind of fermentive process, and bring about the change. It is a fact, however, that whether the disease arises from fluke or fatty degeneration, the great cause is due to the animals being put out to pasture at the latter part of summer, and this is well confirmed by the appearance

of those that are kept indoors; for not only are they free from both Hoose and Diarrhœa, but in spring, when offered for sale, they are in a better condition, and bring considerably higher prices to the breeder than those poor, ill-conditioned-looking animals that have been turned out the previous autumn. And, as already stated, I therefore recommend that all young stirks be kept in loose or airy courts till they are twelve months old, and the grazing pastures to be dressed with rough crushed rock-salt in the spring months.

The noticeable difference in the symptoms of the two diseases I have observed are that the Fluke cases generally commence with a tickling cough, followed by diarrhœa, with an irregular appetite, great thirst, and the animals generally linger on till their bodies are completely wasted before death closes the scene. In fatty degeneration we have no cough, no appetite, great thirst, rapid emaciation, excessive diarrhœa; the fæces has a peculiar sickly smell, and the animals generally die very suddenly.

As the treatment of both Hoose and Diarrhœa when fully developed is so very unsatisfactory, our attention should be given to the best means of prevention, not of these complaints alone, but also that of the numerous affections which carry off so many young calves in their early life, more particularly White Scour, which has been so prevalent this recent spring, and if we could by any means assist the breeders and feeders in manipulating their feeding materials, draw attention to sanitary measures, such as drainage and ventilation, and thereby save the lives of the young cattle and prevent the drain on the national wealth of the country, such as exists in the present day in the purchase of so much live and dead meat—money going out of the country which might be kept in—we should be looked upon as a scientific body, and worthy of the name of a profession. But these matters need further inquiry, and we have both good men and true in our ranks who are able and willing to investigate these questions. It is impossible for any single individual to devote the time and money necessary for experiments without State aid, and being of national interest, they should be supported and placed under Government auspices, and on a somewhat similar basis to that which they work on the Continent; but I am sorry to say the ruling power of this country is too slow to perceive some of its national wants.

On the conclusion of Mr. Thompson's paper,

Professor WILLIAMS said the paper was a masterly one, but he could not admit that Mr. Thompson was right in all his conclusions respecting Foot-and-mouth Disease. But he could not go into that question, because he was to do so elsewhere. Young sheep and calves put on to a pasture in the back end, on which old sheep had grazed the preceding summer, were almost sure to become affected with Hoose. The ova were taken into the stomach with the leaves of aquatic plants, growing by the side of stagnant water, and passed into the circulation, and so found their habitat in the lung tissue, which in time develop and liberate as many as 300 small worms from one parent. Speaking of fatty degeneration of the liver, he said there were four ways in which fat may accumulate in the tissues pathologically to constitute disease. First of all when there was too much fat or fat-forming material in the food; when the blood does not contain sufficient oxygen to oxidise the fat, as, for instance, in cases where animals have too little exercise; when the fat liberated from the nitrogenous food during nutrition was not oxidised; and when the fat formed during the breaking up of the protoplasm during nutrition was not oxidised, and so remained in the cell, and he had no doubt whatever but fatty degeneration of the liver, in many instances, was the cause of fatal Diarrhœa in both cattle and sheep. He had also seen troublesome and serious Diarrhœa arising from strongles in the fourth stomach. Singly, they could not be seen by the naked eye, but on close observation the fluid in the stomach could be seen to move, which, on microscopic examination, re-

vealed myriads of strongles. In concluding his remarks, he reminded them that cattle were ruminating animals, a fact which was sometimes lost sight of, but which should be always kept in view when selecting their food. Nature intended the animal to chew the cud, and eat rough food; and people who pampered their animals in early life would reap the penalty always inflicted on those who were impertinent enough to abuse nature's laws. (Applause.)

Professor WILLIAMS then submitted a number of microscopic sections, which were examined by the meeting with great interest, showing two good specimens of fatty degeneration of the livers sent to him by Mr. Thompson, from subjects named in his paper, one slide of amyloid liver, a beautiful section of lung tissue, showing strongles coiled upon themselves, and a section of actinomykosis, etc., etc. The Professor further remarked upon the great and growing good the formation of these societies had upon the profession, and urged all to prepare and read a paper on some subject, and, above all, to make a more extended use of the microscope, for he could assure them that he had the greatest of pleasure in searching into the hidden mysteries of nature. Another thing he wished to bring before them was, the National Veterinary Medical Association, which would meet in August, this year, at Manchester, he believed; but he thought that before the Society could be of much service to the profession, it would have to print its own matter, and in order to do that, he urged all to join the movement.

Mr. DAWSON said he was a believer in the germ theory of disease, and he was of Mr. Thompson's opinion as to the working of the Contagious Diseases (Animals) Act. Policemen talked of the first and second and third stages of Foot-and-mouth Disease, while veterinary surgeons stood back; and it was high time that the horse was put before the cart, and that the present topsy-turvy state of things should be put an end to. He believed the cattle restrictions had been in a sense a failure.

Mr. ROBERTS, speaking of Foot-and-mouth Disease, thought half-a-mile radius was sufficient for the purpose of isolation. (Hear, hear.) He did not think the disease was indigenous to this country, and he believed by careful police regulations the thing might be entirely stamped out and kept out, if it was only prevented from being re-introduced from foreign countries. He was in favour of isolation to a certain extent, but certainly not to the preposterous extent which the country had recently had to experience. (Cheers.)

Mr. PEARS having made a few remarks complimenting Mr. Thompson upon his paper, Mr. WATSON followed, re-echoing some of the views expressed in the paper.

Mr. COATES said he believed they would never be able to do much with Foot-and-mouth Disease until they had found out the cause of it. He did not think that restrictions did very much good. When a case occurred he would let it take its course.

The CHAIRMAN: Let every tub stand on its own bottom. (Laughter.)

Mr. COATES: Yes.

The CHAIRMAN recalled the time when Foot-and-mouth Disease broke out in this country. A cure resorted to was large fires lighted from tinder kindled by beating iron until it became red hot. This went under the name of "*need fire*," and was carried from place to place by a man on horseback, at full gallop. The cattle were put amongst the smoke and then taken home. (Laughter.)

Professor LEWIS said he listened with pleasure to Mr. Thompson's paper. Mr. Thompson seemed to think that Foot-and-mouth Disease might spring up spontaneously; he did not agree with that; and he was surprised the other day to see that the Privy Council were taking up somewhat of the same view, holding that continued outbreaks were not so much due to foreign importation

as to circumstances existing in the country. (Hear, hear.) Up to the present it had not been satisfactorily proved that the micro-organisms found in the excretions of animals affected with Foot-and-mouth Disease were the cause of the disease. Many seemed inclined to question whether a greater loss would be caused by the disease being allowed to take its course than by carrying out the restrictions. The disease was a mild one and seldom proved fatal. If it was a practical fact that the disease did not cost so much to the country as the carrying out of the regulations, then the question rose whether the restrictions ought to be put on; but if it was a question of getting rid of the disease, then undoubtedly restrictions must be carried out with great strictness, as each case of Foot-and-mouth Disease acted as a centre from which the contagion spread. It was a little ridiculous to use policemen for inspecting instead of veterinary surgeons; and he had known cases where Foot-and-mouth Disease remained on farms long after the premises had been declared free.

Professor WILLIAMS said he was of the same opinion as Dr. Crichton, that a disease may originate *de novo* and become a contagious disease under certain circumstances. He was of opinion that Foot-and-mouth Disease can be suppressed. It came from abroad first, and he denied the assertion of Dr. Lyon Playfair that Foot-and-mouth Disease had become indigenous to this country. The Contagious Diseases Act had been carried out properly in Scotland, where the Local Authority was composed of magistrates and tenant farmers, and they had suppressed the disease. In Scotland, also, the policeman was kept in his place, and he had done his duty well and to the satisfaction of the inspector. In England they carried out the Act in a different way. They had a shoemaker or some individual of that kind connected with the village or town who was looked upon as a big magnate, and he laid down the law; but in Scotland, where the Local Authority was composed of men who knew the subject, they were able to cope with the disease. He maintained that the disease was due to contagion and contagion simply. The law was hard in this way. There were so many petty authorities in the first place. If the disease was to break out in one byre in this county the whole county would be scheduled by neighbouring counties. The thing was ridiculous nonsense, which any one of common sense would admit. (Loud cheers.) Half a mile circuit was quite sufficient. (Cheers.)

Mr. SOULSBY was also of opinion that half-a-mile circle was sufficient, and Mr. DONALD said the way in which the Act was carried out in Cumberland and Westmoreland was such that the cure was worse than the disease. (Cheers.)

After some remarks from Mr. Watson and Mr. Lawson,

Mr. THOMPSON replied, and said he thought his remarks on Foot-and-mouth Disease favoured the germ theory, in which he was a great believer. With respect to the restrictions, it was very remarkable that so much attention was paid to the welfare of horses and cattle, and so little to human beings, and he could only think of one reason for this, which reminded him of a Cumberland story related by the late Wm. Dickinson, of Thorncroft, where a "Jack-of-all-trades" took up doctoring both "man and beast," and one of his neighbours told him "to mind and only doctor fooak (folk)." "What for?" demanded the would-be doctor. "Why for this," said his friend, "thou sees beasts costs brass (money)." And he thought this was confirmed when the Prince of Wales, in proposing a vote of condolence to the relatives of the late Mr. Booth, said that Mr. Booth had been one of the principal movers in the Contagious Cattle Diseases Bill—Mr. Booth having lost in one year thirty-two of his valuable short-horn animals from Foot-and-mouth Disease, which was very remarkable, as the complaint was very rarely fatal amongst ordinary stock, and was, in his opinion, due to the constitutions of the animals having

become weakened by the purity of their blood, thus rendering them more susceptible to the disease; and he thought it would be much better for landowners and farmers to turn their attention more to farm sanitation, and have silos erected, cause all rough grasses on old-laid grazing pastures to be mown in the autumn and made into ensilage, which would have many beneficial results. It would not only destroy the winter shelter of some of the insect pests, but would secure a good, wholesome food for the young animals, so that they could be kept indoors, and thus be prevented from contracting either Hoose or Diarrhœa.

The CHAIRMAN said that a great deal of matter in Mr. Thompson's paper had not been touched, and he proposed that it be brought forward at next meeting for further discussion, which was agreed to.

Complimentary votes of thanks were given to Mr. Thompson for his paper, to Professors Williams and Lewis for their attendance, and to the Chairman for presiding, the proceedings terminating at about five o'clock, having lasted three hours.

J. DONALD, *Secretary.*

LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

THE usual quarterly meeting of this Association was held at the Blackfriars Hotel, on June 11th, 1884.

Present:—Peter Taylor, Esq., President, in the chair; and with him Professor Williams, also Messrs. Thos. Greaves, Wm. Whittle, E. Faulkner, J. W. T. Moore, J. S. Hurndall, Thos. Briggs, S. Locke, T. Hopkin, A. W. Briggs, W. A. Taylor, Jno. Lawson, A. M. Michaelis, J. W. Ingram, E. Kitchen, W. H. Bridge, Wm. Woods, R. S. Reynolds, and J. B. Wolstenholme, members; also visitors—Messrs. Roughsedge, Delacherois, and Jones.

The minutes of the last meeting were read and confirmed.

Letters of excuse were received from Professor Walley, and Messrs. Wm. Dacre, A. Darwell, H. Thompson, G. Morgan, C. Phillips, and William Leather.

The Secretary read a letter he had received from the Western Counties Veterinary Medical Association, also one from Mr. Wm. Woods, jun., in whose absence the Secretary nominated for membership, Mr. Joseph Abson, M.R.C.V.S., of Snighill, Sheffield.

Mr. Thos. Greaves then referred to his recent election as member of Council R.C.V.S., and thanked the members of this Association for their efforts towards placing him in this honoured position.

Mr. J. S. HURNDALL then read the following paper:—

Is there a fixed Law in Therapeutics?

Mr. President and Gentlemen,—I deem it no light honour that the executive of this learned society has considered it advisable to ask me, thus early in my connection with the Lancashire Veterinary Medical Association, to read a paper at one of its meetings for business, and I am deeply sensible that in accepting this honourable position, no slight responsibility rests upon me, for, I take it, that an association which is representative of an important profession in a large and influential county, such as Lancashire, has a right to expect that those members who undertake to furnish, at its periodical reunions, subjects for discussion, shall do so only after careful and deliberate thought, with an earnest desire to do their utmost, according to the light that is in them, to advance the interests of their profession, and if possible so as to extend the sphere of the association's usefulness, beyond the immediate bounds of individual interests. With this view of the essayist's duty firmly implanted in my mind, I felt it was nothing short of a necessity that I should select

the subject which had occupied my serious consideration the most recently, because, with barely three weeks at disposal in which to prepare my paper, it would be well-nigh impossible to formulate definite views and collate facts in a clear and concise form upon freshly studied matter. Ever since I gave my serious attention to the study of veterinary medicine my mind has been more or less exercised by what, from the first, seemed to me to be the very uncertain ground upon which is based the selection of remedial agents for the alleviation of disease; and as time went on, and I became better qualified to examine this interesting subject, I did not find the difficulty lessened. I turned to the writings of those who, by reason of their learning and experience, were highly qualified to guide my researches into the right groove, and I discovered that these gentlemen, noted though they were for erudition, had been and continued to remain in a chronic condition of uncertainty respecting the true application of therapeutics; in support of this view of things, allow me to read a quotation from a lecture, delivered some years ago before the Royal College of Physicians of England by the then president, Dr. Paris. Referring to the magnificent collection comprised in the Materia Medica of the the college, Dr. Paris says: "Glancing at the extensive and motley assemblage of substances with which these cabinets are overwhelmed, it is impossible to cast our eyes over such multiplied groups without being forcibly struck with the absurdity of some—the disgusting and loathsome nature of others—the total want of activity in many—and the uncertain and precarious reputation of all; or without feeling an eager curiosity to inquire from the combination of what causes it can have happened, that substances at one period in the highest esteem, and of generally acknowledged utility, have fallen into total neglect and disrepute; while others of humble pretensions and little significance, have maintained their ground for so many centuries; and on what account materials of no energy whatever have received the indisputable sanction and unqualified support of the best and wisest practitioners of the age. That such fluctuations of opinion and versatility in practice should have produced, even in the most candid and learned observers, an unfavourable impression with regard to the general efficacy of medicines can hardly excite our astonishment, much less our indignation; nor can we be surprised to find that another portion of mankind has at once arraigned physic as a fallacious art, or derided it as a composition of error and fraud. They ask—and it must be confessed that they ask with reason—What pledge can be afforded them that the boasted remedies of the present day will not, like their predecessors, fall into disrepute, and in their turn serve only as humiliating memorials of the credulity and infatuation of the physicians who commended and prescribed them." So far Dr. Paris. I might quote much more extensively, would time permit, from this learned man's "Pharmacologia," but the further one goes into the study of his views upon this subject, the more perplexing matters become. Again, in one of the volumes of Braithwaite's "Retrospect" appears the following: "Dr. Johnson (assistant-physician to King's College Hospital) truly observes that on few subjects is there such diversity of opinion as upon the effects of remedies in disease, their modes of action, and the best methods of administering them."

Dr. Sydenham, who has been referred to as the father of English medicine, evidently felt keenly the urgent need of some guiding principle in the selection of remedies, for he says:—"The method whereby, in my opinion, the art of medicine may be advanced turns chiefly upon what follows, viz., that there must be some fixed, definite, and consummate method of healing, of which the common weal may have the advantage. By *fixed*, *definite*, and *consummate*, I mean a line of practice which has been based and built upon a sufficient number of experiments, and has in that manner been proved competent to the cure of this or that disease." Finding that views, so forcibly expressed

by practitioners of great repute, so closely coincided with my own, you will not be surprised, Mr. President and gentlemen, to learn that I was more than ever anxious to discover whether, or no, any suggestion helping to clear away the mist from my mental vision had ever been propounded, and on further search among medical literature I soon found that a claim had been established by one who professed to have discovered a law, by the application of which it seemed possible to bring disease and remedy in closer relation the one to the other ;—in other words, that what Dr. Sydenham, after much experience, deemed essential in the practice of medicine, was really within our reach, viz., "a fixed, definite, and consummate method of healing."

I soon discovered, however, that a very large proportion of the medical profession, and with the exception of a few isolated instances, the whole of the veterinary profession, considered such a thing as a fixed law in the practice of medicine impracticable ; nay, further, I have heard it said that it was undue interference with the liberty of the practitioner to suggest the possibility of a fixed law. I must confess to you, gentlemen, that to my mind that assertion seemed somewhat unreasonable ; for I argued with myself that if the Creator of this world had ordered fixed and definite laws for the regulation of Nature, all of which are rendered subordinate to man's interests here, surely there is nothing so very outrageous or wonderful if in the order of Providence it had been ordained that there should also be a law to assist in determining with approximate certainty what remedies would be applicable to alleviate all the pains and penalties to which poor human nature is susceptible ; and notwithstanding the strong array of opinion against such a possibility, I determined to look into the matter, with an earnest and conscientious determination to find out for myself what might be the truth. I remembered having read how much ridicule and contumely was poured upon Harvey when he first enunciated his discovery relative to the circulation of the blood ; how Jenner was accused of quackery and laughed to scorn by almost the whole of the medical profession when he announced the discovery of vaccination. Yet both of these great and important discoveries came to be generally accepted, and I asked myself, why not a fixed law in therapeutics? As you are all well aware, gentlemen, there are fixed laws in nature ; for instance, the law of attraction in physics ; the law of chemical affinity and definite proportion in chemistry ; the law of diffusion of light in optics ; and why not a therapeutic law? Surely there is in this no very great stretch of the imagination.

I do not appear before you to-night, Mr. President and gentlemen, to dictate and dogmatise to you ; such a role would ill become me in the presence of those who, in virtue of qualification and experience, stand head and shoulders above me in the noble profession of my somewhat recent espousal. At the same time, I should be unworthy to hold my degree did I not, with due respect to my professional confrères, steadfastly maintain an opinion arrived at after mature consideration, even though the same be somewhat at variance with the majority. Such being the case, I have now, on my own behalf, to answer the question involved in the title to this paper in the affirmative, and to state it as my opinion that we have a fixed law in therapeutics. It now becomes my duty to explain on what grounds I deem this to be a fact ; but, in the first place, it is only due to the great discoverer of the law that I should tell you who and what manner of man he was, notwithstanding the probability that you all anticipate to whom I refer, viz., Dr. Samuel Hahnemann.

With a view to conciseness, I propose to give a few quotations from Dr. Dudgeon's biographical sketch :—"The histories of many men who have risen to eminence in some particular branch of science, teach us that they have done so under the most unfavourable circumstances, and in spite of

the greatest obstacles thrown in their way by fortune and by their own natural guardians. Hahnemann belonged to this class of great men. His father, an industrious but fortuneless painter on porcelain in the celebrated manufactory at Meissen, a charming little town on the banks of the Elbe, near Dresden, discouraged all his endeavours to qualify himself for a calling superior to that he himself pursued, though he seems in other respects to have had a great influence on the character of his son by his exhortations to him to exercise his independent judgment in all cases, and not to take anything on trust, but in every case to act as reflection told him was for the best. On leaving school it was the custom to write an essay on some subject, and Hahnemann selected the somewhat unusual one of 'the wonderful structure of the human hand,' a theme which has in our own time been so beautifully discoursed upon by Sir Charles Bell, in his 'Bridgewater Treatise.' Twenty thalers (about three pounds sterling, the only patrimony he ever received), and his father's blessing, were all he carried with him from Meissen to Leipzic, where it was his intention to study medicine. He was allowed free access to the various classes, and managed to support himself by teaching French and German, and by translating books from the English.

"From Leipzic he journeyed to Vienna, in order to witness the practice of medicine in the hospitals there. After a sojourn in Vienna of only three-quarters of a year, he found himself forced to accept the situation of family physician and librarian to the governor of Transylvania, with whom he resided in Hermannstadt two years, and whence he removed to graduate in Erlangen in 1779. 'The longing of a Swiss for his rugged Alps,' he says, in an autobiographical fragment he has left behind him, 'cannot be more irresistible than that of a Saxon for his fatherland.' Accordingly to fatherland he went, and settled down to practise in a small town named Hettstadt, but as there was no field for practice here, he removed, after three-quarters of a year's residence, to Dessau, in 1781."

Dr. Dudgeon then goes on to explain how Hahnemann gave successful attention to the study of chemistry, published many chemical works, the most celebrated of which was a treatise upon poisoning by arsenic.

"In 1789 he removed to Leipzic, and in that year published his treatise on Syphilis. . . . . In 1790 he translated Cullen's Materia Medica, and discovered the fever-producing property of cinchona bark, which was to him what the falling apple was to Newton. . . . . From this single experiment his mind appears to have been impressed with the conviction that the pathogenetic effects of medicines would give the key to their therapeutic powers. . . . . He wrote at this period a large number of chemical essays, and translated several chemical and other works, besides Cullen's, just named. His diligence must have been something extraordinary at this time; . . . . the poverty which Hahnemann endured was not merely an income so small as to prohibit an indulgence in the luxuries of life, but often, very often, an actual want of the common necessaries of existence, and this with all the anxiety of an increasing and helpless family of young children. . . . . The hostility of the apothecaries and physicians of Konigslutter drove him from that town in 1799." After various removals, ... "he planted himself in Eulenburg, but the persecution of the superintendent physician of that place drove him thence after a short sojourn. . . . . The years 1805 and 1806 were eventful ones for the development of his doctrine, and whilst he demolished the time-honoured faith in the medicine of 3000 years in his masterly little work entitled 'Æsculapius in the Balance,' the temple of his own system, of which he had hitherto been only laying the foundations, commenced to exhibit some of those fair proportions which we now admire, by the appearance of the first sketch of a *Pure Materia Medica*, which he gave to the world in

Latin, and of that wonderful exposition of his whole doctrine, entitled 'The Medicine of Experience,' which was published in 1806 in 'Hufeland's Journal.' . . . . During his residence in Leipzic, from 1810 to 1821, he from time to time published valuable essays in the literary journal I have already alluded to, one of which was on a deadly form of typhus that broke out in 1814, in consequence of the disturbances caused by the stupendous military operations of that period, more particularly by the disorderly retreat of the French army from Russia. . . . . A second edition of the *Organon* and five more volumes of the *Materia Medica* appeared during this period, adding at once to his fame, and to the perfection of his system, which began to attract the attention of many physicians, and immense numbers of the educated and upper classes. In the year 1831, the Cholera invaded Germany from the East, and on its approach Hahnemann, guided by the unerring therapeutic rule he had discovered, at once fixed upon the remedies which should prove specifics for it, and caused directions to be printed and distributed over the country by thousands, so that on its actual invasion . . . . those who had received Hahnemann's directions were fully prepared for its treatment and prophylaxis, and thus there is no doubt many lives were saved, and many victims rescued from the pestilence." In 1835, Hahnemann, then in his eightieth year, removed to Paris, surviving some eight years; there he died, full of years and of honour, at the age of eighty-nine, on the 2nd July, 1843.

I must apologise for having occupied so much of your time with an account of the founder of this great system of medicine, but I was anxious to show you what difficulties Hahnemann had to overcome and obstacles to surmount; that his life was not occupied in mere theorizing under the sunshine of prosperity; it would have much more thoroughly contributed to his earthly comfort and prosperity had he continued to practise medicine as he began. This, however, he was too conscientious to do; having the conviction of a great truth in his mind, it must be worked out, even at the cost of personal comfort and the ordinary necessaries of life. He was vilified and calumniated because of the views he expounded, but that was of little import to one who, like him, held it to be his first duty to uphold what he considered to be truth. Such was this great man, and none who prize uprightness of character can, if they study carefully his life and doings, be otherwise than favourably impressed by his example of fortitude, bravery, and perseverance.

The immense amount of work, the untiring zeal, the entire abnegation of self involved in the task which Dr. Hahnemann set himself to fulfil are quite beyond the power of ordinary men to express; and it is only those who will carefully and conscientiously examine such of his writings as refer to this subject that can approximately appreciate the man's character. Lord Bacon once wrote: "Read, not to contradict and confute, nor to believe and take for granted, nor to find talk and discourse, but to weigh and consider;" and this, gentlemen, I respectfully submit, is the frame of mind in which he should be who would study Dr. Hahnemann's views of the action and remedial power of medicinal agents, and the relation of the same to disease. I have already referred to the incident which appears to have first impressed Hahnemann with the idea that "the pathogenetic effects of medicine would give the key to their therapeutic powers"; viz., the fever-producing property of cinchona bark. Following up this mental suggestion by zealously experimenting with other drugs, he satisfied himself that he had discovered a "fixed, definite, and consummate law of healing," and gave expression to it in the formula, "Similia similibus curantur," or likes are cured by likes. Hahnemann's definition of the proposition is as follows: "In order to cure gently, quickly, unfailingly, and permanently, select for every case of disease a medicine capable of calling forth by itself an affection similar to that which it is intended to cure."

Dr. Dudgeon, in another of his extremely able and well-wrought-out lectures, say: "Now this, ... giving us as it were a glimpse, a hint as to what we should do, is very far from instructing us adequately as to how we are to select our remedy for a given case of disease. We have seen how we are to ascertain the affections medicines are capable of producing, viz., by testing them on the healthy individual."

Before proceeding, allow me to remind you that this law, which is one of similars, really means *like to*, and not identical with; for unless this is carefully kept before the mind, he who would first undertake the consideration of this subject is very easily beset with difficulties, which in reality do not exist. There is a decided difference between similar and identical; nevertheless, I have met with several among my professional friends who have fallen into the error of confounding the meaning of these words. Dr. Dudgeon puts the matter thus: "Had the condition of cure depended upon the discovery of an affection, as the action of a medicine identical with that to be cured, there would have been much less difficulty in making our selection, provided always these identically-acting drugs could have been procured, for identity is something absolute, and admits of no degrees of comparison.

"But such is not the case; the law of cure is a law of similars only, and similar is but a relative term, and admits of degrees of comparison, as more similar and most similar.

"In considering, therefore, the question of the selection of the remedy, seeing that the epithet 'similar' is not a definite expression, it will be requisite to ascertain, if possible, its limits, to answer the question: '*What is similar?*' for unless that be done, it were vain to think of curing according to the therapeutic law of similars."

Now, in order to arrive at a true definition of the meaning of this law, I must remind you that there are two sets of indications to be relied upon, viz., first, those of the patient; and, second, those produced on a healthy person, as the result of taking a given drug with the view of ascertaining the effects thereof. If the total and aggregate symptoms produced during a proving of a drug coincide with and are like those existing in a sick person, then you may be assured of having hit upon the right remedy. By symptoms, whether of natural disease or artificially produced by taking a drug in health, I mean a deviation from the normal condition of the body, such as might be observed by the patient or the physician; they may be objective or subjective. It has been objected that this is treating symptoms and not disease; that physiology and pathology are alike ignored. This, however, arises from a misconception of the real state of things. Symptoms do not constitute the true essence of disease; in other words, they are not the disease, but the result of it. Were it not for symptoms, however, we should have no indication of a diseased condition, and without the existence of symptoms, we should be unable to argue that disease existed; we can only recognise disease through the existence of symptoms.

(*To be continued.*)

LINCOLNSHIRE VETERINARY MEDICAL SOCIETY.

THE usual quarterly meeting of this Society was held at the White Hart Hotel, Gainsborough, on Thursday, the 26th June, the President, J. Mackinder, Esq., Peterborough, in the chair. The following members were also present:—Messrs. J. Brown, Navenby; T. Greaves, Manchester; W. A. Field, Grimsby; T. E. Smith, Market Rasen; F. A. Holmes, Hemswell; G. Osborne, Fulstow; R. T. Hardy, Sleaford; J. Hool, Sleaford. Visitors:—W. A.

Taylor, Manchester, and H. Theakston, Gainsborough. Apologies for non-attendance were received from Professors Robertson and Walley, Messrs. H. Howse, F. Spencer, G. Goodacre, B. H. Russell, J. W. Gresswell, W. G. Dickinson, J. M. Axe, and W. S. Carless.

The minutes of the previous meeting were taken as read, Mr. T. E. Smith acting as Secretary in the unavoidable absence of the Hon. Secretary.

Mr. HARDY proposed the election of Mr. James Smith, of Louth, and Mr. HOOL proposed Mr. Geo. Bland, of Boston. Both names were submitted to the meeting, and unanimously approved.

Mr. HOOL drew attention to the inconvenience caused by the hour at which the meetings took place. He suggested that Rule 6 be obliterated, and the time of the meetings fixed by the Secretary, and that the next meeting be at 12.30 p.m.

Mr. SMITH seconded that the next meeting be at Sleaford on the day fixed, at 12.30 p.m. Carried unanimously.

The PRESIDENT then said: Gentlemen, I beg most sincerely to thank you for the high honour you have conferred upon me by selecting me as your President for the ensuing year. I can assure you that nothing shall be wanting on my part to promote the best interests of this association. You have met to hear a paper read by Mr. T. Greaves, of Manchester (a name well known and respected by all), on a subject of vital importance, but before calling on him, I wish to invite your attention to the purchase by this association of some of the most expensive books and instruments for the use of its members. You know full well that there are certain instruments, such as those used in dentistry and lithotomy, etc., which are too expensive for an ordinary practitioner to obtain. I may say other associations have done so, and from what I have heard, it has been a great boon to many of them. (Hear.)

Mr. HOOL asked if the President would propose to buy the books or instruments out of the present funds, and, if so, what instruments would be selected?

Mr. GREAVES said: One instrument purchased by the Yorkshire Association was a tooth forceps, Thompson's shears. He recommended this as a very useful instrument.

The PRESIDENT: I have that myself, and shall be happy to lend it.

After a brief discussion, the CHAIRMAN said he would make inquiries as to the books and instruments required, and report to the next meeting.

Mr. GREAVES reminded the members of the meeting of the Manchester Veterinary Association next month, and hoped they would support him as President of that Association. Four subjects would be discussed. Professor McCall on food supply as obtained from animals; Foot-and-mouth complaints, by Professor Williams; and they expected to have Sir Frederick Fitzwygram, Dr. Fleming, Professor Robertson, Professor Whalley. There would also be a paper on "Influenza in the Horse," by Professor Pritchard, the discussion on that subject being opened by Mr. Edgar, Dartford; also one on "Cruelty to Animals," by Mr. Briggs, of Bury, the discussion to be opened by Professor Pritchard. They would have some of the best men there, and they expected the discussions would be very interesting. He hoped the members of the Lincolnshire Veterinary Medical Society would not forget the 30th and 31st July, at Manchester. The members of the Association are, he said, invited to partake dinner with the Lancashire veterinary surgeons.

The PRESIDENT, after a few preliminary observations, called upon Mr. Greaves to read his paper on

"*Glanders in the Horse: Its Nature and Prevention.*"

Mr. GREAVES, in the course of his paper, said that Glanders was always looked upon as the most malignant, terrible, and dangerous disease to which

the horse was subject, and, unlike almost every other disease, if the Glanders microbe got imported into the system, by any means whatever, its effects in nearly every case were mortal. Influenza, Pneumonia, Enteritis, Hepatitis, and a host of other diseases may attack the system, even in the most virulent form, and subside again, leaving not a trace behind; but if the real disease-producing element or poison of Glanders or Farcy enters the system it is never eradicated. There is an irregularity and uncertainty in the period of incubation, and some obscurity about it. The patient may rally apparently for a time when enjoying genial and favourable conditions, and may live an indefinite period in an apparently healthy state and the disease be unsuspected, but sooner or later the small living micro-organisms, which really constitute the disease, and which are all the time lying latent in the system, will, when subjected to extremes of heat or cold, suddenly become resuscitated and manifest their full vigour and vitality; an active ferment is set up, the poison germs are cultivated in the whole system, creating a loathsome, virulent, and putrefying condition of every tissue in the body, and if the animal be not destroyed, in nearly every case death mercifully puts an end to his sufferings. He illustrated his statement, that a patient may rally for a time under favourable conditions and live an indefinite period in an apparently healthy state, by citing two cases which had come under his observation. He had seen cases in which scores of Farcy buds existed with corded absorbents, and nostrils covered with true chancre ulcers and tumefied glands, and in whose lungs there were not the slightest appearance of miliary tubercles. Thus even Glanders and Farcy may exist in some cases, and yet the vital organs not be impaired. In such cases the animal may live for years. His contention was, that had these horses, to which he had referred, continued where they improved so remarkably, where the climate, stables, and conditions were so genial to them, the seeds of disease would have lain quiescent, dormant in them for months or years, and the disease escape detection or identification, but that the seeds of the disease would become resuscitated, and the active ferment set up again at any time if they were placed in altered conditions of extreme heat or cold, favourable to the cultivation or reviving the glander germs which still existed. The germs of Glanders can lie latent in other conditions in other habitats than animal organisms. Percivall, in his "Hippopathology," gives an example at Leschie, where Glanders broke out amongst the troop horses with such violence that the stables were obliged to be shut up, *locked up for thirty years*, but from the circumstances of another war they were again opened, and then from the infection having remained in the stables all the time, the horses that were put into them became immediately glandered. One of the most interesting questions that can occupy the mind of the physiologist is to try to solve the question whether these micro-organisms which produced Glanders in the latter horses were the same micro-organisms which produced the disease thirty years before, or had there been a succession of generations of these micro-organisms during the whole of this period. He believed the cause of Glanders and Farcy to be in every instance referable to contagion—that there must be a specific glander poison or glander germ to produce Glanders—that this specific poison or germ can only produce this disease, it can produce no other disease, and no other poison or germ can produce Glanders. It is an admitted fact that the difference in degree of susceptibility in animals is as wide as the poles. It would be very fallacious reasoning to argue, therefore, that because every horse in a stable where Glanders happens to be does not catch the disease, that Glanders is not contagious. I believe, continued Mr. Greaves, that germs—Bacteria, Bacilli, or Microbes—of any species in certain conditions, may be so cultivated that they shall become more powerful, malignant, and virulent; or some germs —Bacteria, Bacilli, or Microbes—under other conditions, may be so

weakened that they can scarcely produce any effect whatever; but I do not believe they can be changed in their nature—that is, their species, their individuality. I am not so sure as to whether the glander germ may not be capable of being transmitted and be hereditary. I have a full and confident belief in the advancement of science, and that microscopes and other means will in time advance to that state of perfection that the germ, Bacillus, or Microbe of Glanders, Small-pox, Cattle Plague, and all other infectious diseases, will be detected and known with a distinctness, and individuality, and certainty, and that it will be found that they are as different as the spider and the common fly. Again, because Glanders breaks out occasionally in a foul, ill-ventilated stable, is that a proof that it is the foul stable and not contagion from which it has emanated? I am certain it is not so; it depends upon other conditions. I can tell you that I have known many foul stables where the miasma and strong smells were intolerable, and had been so for many years, but in them Glanders had fortunately never been known, although Influenza, chest diseases, etc., rode rampant. In other stables where the ventilation and drainage could not be found fault with, they being sweet and healthy, there isolated cases of Glanders had a transient existence. To prevent the disease, the consideration of the first and greatest importance is the most careful avoidance of coming near any diseased animal, either in-doors or out of doors, going into an infected stable, or allowing other horses to come into your stables. Next in point of importance is the character of the atmosphere of the stable in which your horses live. See that it is free from pollution or miasma from foul drains, have surface drainage if possible, have your ventilation on correct principles, a current of air through the stable if possible. Sanitary science is all important; sprinkle quicklime all over the floor twice a-week; keep your stables a comfortable genial temperature; good sweet wholesome food, good water; not overworked, great care taken both in the stable and at work; all these points attended to, and it will ensure an immunity from Glanders. Supposing the disease has gained an entrance, the producing element radiates; every horse in the stable imbibes more or less of it. The best course to pursue is to have the affected horse or horses removed at once. If they are decided cases, they should be destroyed at once; if not bad cases, they can be removed to a distance and kept completely isolated. Secondly, have the stalls they occupied thoroughly cleansed. This consists in having the manger, rack, boskins, and wall well washed with boiling water, McDougall's soap and brush. Put a white-hot fire in a movable grate in these stalls an hour at a time twice a-day for a week. Thirdly, fumigate every stall in the stable with carbolic acid fumes every day for a week, and then twice a week for a month. Fourthly, let every horse in the stable be carefully and strictly examined all over for any symptoms of Glanders or Farcy. This examination should be done twice a-week by the veterinary surgeon himself; extra care should be taken of every horse, and in this way in nearly every case you may effectually stop its further progress, and get rid of this frightful disease. I fully believe every infected stable may be made clean by these means. In conclusion, Mr. Greaves said, I wish to make a few remarks on the law as it affects Glanders. The law says a man shall give notice to the police of his having Glanders in his shed, but I know of no penalty for his not doing so. If he moves a glandered animal into the public street, he is liable to a fine. The local authority can prevent the movement of all horses out of a stable in which a glandered horse has been standing. This would be in many cases an immense inconvenience and a great hardship—in fact, it would be simply ruin to the owner. At present an Inspector is powerless; a man may have fifty glandered horses in his stable, and no one can order their destruction; he may sell any other horse out of the stable not

apparently diseased, and although it may be only passing through the stages of incubation; he may work them at night and need have no fear of detection, unless some accident or defect attracts the attention of the policeman. Now, to detect and destroy each centre of contagion, and thus prevent its spread, we should have a strict law compelling all slaughter-houses to keep a register, and to make a return of all glandered horses coming into their hands, and state candidly and honestly where they come from. This they do not, they only return such as are sent to them by the Inspector, and they argue that the other cases are unrecognised by them. We cannot force men to see, but we might prevent them from killing any horse with a discharge from his nose, or with suspicious sores on his body or limbs, until examined by the Inspector or a veterinary surgeon. By these means, and by a constant and diligent supervision of slaughter-houses, every glandered stable in the kingdom would become known to the authorities, and then the law could compel all such stables to have surface drainage and undergo the process of cleansing I have indicated. Then Glanders and Farcy in England, instead of being on the increase as at the present time, would become a thing of the past. (Applause.)

(*To be continued.*)

SCOTTISH METROPOLITAN VETERINARY MEDICAL SOCIETY.

THE usual quarterly meeting of this Society was held in the London Hotel, Edinburgh, on Wednesday, May 22nd.

The President, Professor Walley, in the chair.

The following members and visitors were present:—Professors Walley, Williams, and W. O. Williams; Messrs. Connochie, Boyd, Burnett, Cameron, Storie, Aitken, junr., of Dalkeith, Aitken, junr., of Edinburgh, Pow, Rutherford, Hutton, Grey, Young, Haslam, Meek, and the Secretary.

The minutes of the last meeting were read and approved of.

It was proposed by the PRESIDENT, and seconded by Mr. HUTTON, that Mr. Pow, of Jedburgh, and Mr. Cassels, of Lanark, should be elected members of the Society. The motion was carried. The PRESIDENT nominated Mr. J. H. B. Hallen for election at the next meeting. The SECRETARY nominated Mr. Lothian, of Duns.

It was proposed by the SECRETARY, and seconded by Mr. RUTHERFORD, that Mr. Charles Phillips, 3rd Dragoon Guards, should be elected an honorary member. The election was carried unanimously.

Letters of apology for non-attendance were received from Messrs. Phillips and Hallen.

Mr. BOYD, of Melrose, then read the following paper on "Parturient Apoplexy."

Mr. President and Gentlemen,—The subject which I have chosen to lay before you to-day is one which occupies a deservedly important place in our profession. In general veterinary practice it would, perhaps, be difficult to signalise many topics commanding so much attention from a professionally scientific standpoint. In the first place, its occurrence is frequent, presenting itself for consideration and treatment almost perpetually in a general practice; and, secondly, its cause seems to have evoked so great a variety of opinion, and, accordingly, its treatment has associated with it so many different therapeutics, that it claims a prominent position in the research of our scientific and practical profession. In the course of my remarks I shall refer to the *cause* of Milk Fever, as it is commonly designated, and thereafter state the remedy which I have personally found in my practical experience to be followed with greatest efficacy. I do not anticipate that my theory as to its

cause will elicit unanimous concurrence, nor do I expect that my usual treatment of it will meet with universal approval. However, be these as they may, I hope the introduction of so important a subject may lead to more interest in it than at present attaches to it. It is simply reiterating what is most commonly known when I say, various are the theories held and promulgated regarding Milk Fever and its cause. When we carefully examine these theories we find that mostly all of them trace their origin to the fact that lactation is arrested, or to its appearance generally at the time of parturition; perhaps the most prevailing idea is that Milk Fever is due to some special influence at the time of parturition, this belief having its foundation in the fact that most of the cases of this kind happen at this period. No one will venture to deny that at this particular time most of such cases do occur; but, in my opinion, the influence referred to is only secondary in Milk Fever, while I grant that it is a strong secondary influence. It may sound very strange to some when I thus assert as my doctrine that the influence of parturition is only a secondary cause. But, in justification of my assertion, before proceeding to advance proof, let me remark that when a veterinary surgeon meets with cases happening a week or weeks after parturition, his doubts are naturally excited as to the accuracy of the theory regarding the influence of parturition, and he is also naturally led on to inquiry. As the result of my experience, and in harmony with the results of my personal research, I entertain the opinion that cases occurring at the time of parturition have always a beginning before parturition actually takes place; that is to say that the primary cause has been in operation before that special period; and the natural result of parturition, viz., the cutting off of the supply of blood between the mother and the fœtus in the uterus is the great secondary cause of the appearance of disease at that period.

Permit me to offer an analytical explanation. It appears to me that Parturient Apoplexy always begins with and is due to irritation of the alimentary canal. If an inquiry is instituted as to the feeding of the patient prior to parturition, it will be ascertained that there has been a change from the ordinary regimen to a sloppy diet to prepare the cow for calving, as the attendant will indicate; or it will be found that the cow has been fed pretty freely on cotton-cake, both of which strongly tend towards irritation of the bowels. This is not a mere surmise or hypothesis. I can undertake to prove that there is irritation of the bowels. For example, if you evacuate the bowels by means of the hand or by the application of an injection, either before the animal is fairly down or immediately thereafter, you will find that the fæces in the vast majority of cases are very hard and dry, but invariably covered with a thick coating of *mucus* and very frequently blood, which indubitably demonstrates that irritation of the bowels exists. You will further find by the introduction of the hand into the rectum that there is a distinct loss of movement; in fact, the bowel is paralysed before. That the disease has a beginning previous to parturition taking place, is taught by the fact that the cow calves with unnatural ease, the calf, as it were, dropping from her without any apparent effort on her part. No symptom could more forcibly express the loss or suspension of nervous energy. Further, if you introduce your hand into the uterus, it imparts the feeling of a lifeless object. This loss of nervous energy in the uterus is secondary, being caused in the following manner. You all know, without any explanation from me, the great or signal effect which irritation of the alimentary canal has upon the pneumogastric nerve; and when you keep in view the intimate connection between the pneumogastric and sympathetic nerves, and, again, the great nervous sympathy between the bowels and the uterus, you can readily recognise the reason of the loss or suspension of energy in the last-mentioned organ.

Now, as to the cutting off of the supply of blood between mother and fœtus being a secondary cause. This blood supply in the uterus is no more needed, and nature has provided the mammary gland for the manufacture of that blood into milk for the maintenance of the offspring. The question now suggests itself, should the mammary gland be in a condition incapable of forming milk what becomes of the blood? Must it not be thrown back upon the system, creating anything but a natural or normal condition? That there is the loss of function in the mammary gland is too obvious to be called in question; but it remains to be asked and settled, how does this loss of function occur? According to my conception, it occurs through the loss of nervous energy, as I have endeavoured to explain, together with the great flow of blood to the part and the very small portion of which is formed into milk, the great bulk acting as an impediment instead of a stimulus. This blood being thrown back upon the system, and the nervous system being in a state of inactivity, is the first to suffer.

With regard to the treatment of Parturient Apoplexy, very frequently too much effort is expended in the direction of *internal* treatment, while too little attention is given to external treatment and the general comfort of the animal. The floor where the animal has to lie ought to receive unmeasured attention. One kind of floor which I would strongly deprecate is that which is laid with sleepers. Such a floor is always in a most slippery state, and so it happens that when the animal is tumbling about, or more especially when she endeavours to rise, she slips and very frequently falls with a leg under her, or she strides herself, and nothing is noticed till it is time she should be on her feet; but being unable to rise, red softening of the cord gets the blame. But on a *post-mortem* being made, it is revealed that the cause is either fracture of the femur or symphysis pubis. If the floor does not sufficiently conform to one's desire, one thing ought to be done at once. Get it covered at once with pretty thick sods, which have a threefold effect. They supply a soft bed, prevent slipping, and absorb any fluid which tends to excoriate. The next thing demanding careful attention is the putting of the animal into a natural position. For if the cow be allowed to throw herself on her side and lie there, free ingress of air to the chest is prevented, the already depressed is still further depressed, and congestion of the lungs will be the result. When the cow exhibits an inclination to lie on her side packing must be resorted to, in order that she may be kept in a proper position. The best means of attaining this end is to use bags well filled with straw or chaff. The whole extent of the spine should be well stimulated, and the animal well clothed to encourage perspiration. When once perspiration has been thoroughly established, great care should be exercised in order to prevent a chill by the removal of clothing, through the movement of the cow or otherwise, else the gravest consequences may follow. The next thing to be kept in mind is, according to the extent of brain complication so are the other organs and functions in degree; a fact which points to the relief of brain pressure as speedily as possible. Under such circumstances, a smart blister should be applied to the back of the head and cold water to the front, the cold to be kept in constant application. This being done, stimulants should be given to maintain the action of the heart and produce perspiration, which I consider a great essential in the treatment of Parturient Apoplexy. I fear that stimulants are too long continued, and that when the animal begins to regain consciousness stimulants should be gradually diminished, both in quantity and frequency. When the cow does so begin to give evidence of consciousness, should another stimulant be given she will again show signs of brain pressure. But, on the other hand, if the stimulants be diminished she will gradually convalesce, which, I think, demonstrates that the brain having been relieved the heart regains tone, and is almost able of

itself to keep up the circulation; but when a strong stimulant is given, the blood is too rapidly circulated for the still weakened brain, and hence the return of the brain pressure. If the meninges of the brain are congested I find bleeding to be of great service.

I may here mention that the patient ought to be frequently turned from side to side; but special care must be taken to avoid a chill. In so doing, additional care must be exercised to prevent sprains and bruises of the joints. It is imperative that the bowels be emptied as far as possible by means of warm water injections, and the urine regularly taken off. I am not an advocate for purgatives, and this may appear strange, and possibly inconsistent, when I state as my opinion that irritation of the bowels is the cause of Parturient Apoplexy. Still, I fail to see how purgatives can be of use where the bowels are paralysed, especially through irritation; they can only add to the irritation by lying inactive in the paralysed bowels. It may be asked, how do you subdue the irritation? Well, my answer is that the irritation is relieved much in the same way as by the use of sedatives in the cases of irritation of the bowels. Why is opium given in irritation of the bowels but to relieve pain and prevent as far as possible movement in the bowels? And so it is in Parturient Apoplexy, though the loss of nervous force, sensation, and movement are reduced to a minimum, and so nature regains herself. As to the use of the trochar, I find it of very great service where there is any difficulty in swallowing. How many cows are choked, and how many die of gangrene of the lungs, through medicines getting down the trachea, and how many die for the want of stimulants and from their inability to swallow! When the trochar is used, and by the means of a small funnel inserted into the cannula, choking is entirely prevented, and the cow still has her stimulants. I have very great success in cases where there is difficulty in swallowing or inability to swallow through the use of the trochar and cannula, and would strongly urge their use. When the cow has regained perfect consciousness she has a depraved appetite, and will eat dirty litter in preference to anything else; but this must be studiously guarded against. She must be kept on a restricted diet, and by the use of antacids the depraved appetite is removed.

Considerable discussion followed.

Mr. CONNOCHIE, Selkirk, said that he had met with cases showing all the symptoms of Milk Fever occurring as late as ten to fourteen days after parturition. He was of opinion that these were cases of Stomach Staggers. He recommended the administration of stimulants in the first stage of Milk Fever, but was of opinion that the treatment of this disease was generally very unsatisfactory. If the animal was down and unable to rise he advised slaughter. He thought that it was much easier to prevent the disease than to cure it, and recommended strict attention to diet, and plenty of exercise before parturition, and frequent milking afterwards.

Mr. BURNETT, Maybole, thought that about two-thirds of his cases recovered. He recommended frequent milking, the use of fomentations to the udder, and stimulants to the spine, and careful attention to the position of the animal. He was of opinion that internal treatment was very unsatisfactory during the comatose stage of the disease.

Mr. CAMERON, Berwick, said he had seen cases of Milk Fever occurring three or four weeks after calving, and believed it to be similar in its nature to Muco-enteritis in the horse; that cold, windy weather was the great exciting cause of it. In making *post-mortem* examinations he had found the spinal cord very much softened. He further recommended keeping the beast in a proper position by packing it up on the sternum. He objected to giving large doses of purgative medicines, and recommended the use of hyposulphite of soda, belladonna, and carbonate of ammonia, and bleeding from the milk vein.

Mr. STORIE, East Linton, approved of fomentations to the udder, and believed that the disease was in a great measure caused by the feeding. He had seen cases of Milk Fever occurring before calving. He objected to the administration of large quantities of medicine.

Mr. YOUNG recommended the administration of stimulants. He, also, had met with cases of Milk Fever before calving.

Mr. RUTHERFORD thought that in only one case out of three did the animals so affected recover. In the first stage he approved of bleeding, and the administration of a large dose of whisky and the application of cold to the head. If the animal had gone down, treatment was of little value.

Professor WILLIAMS said that the disease was mainly due to disorder of the digestive organs, and recommended the closest attention to the general condition of the animal, frequent milking and the administration of stimulants, if the animal could swallow.

Mr. CUNNINGHAM, Slateford, had tried the trochar in the treatment of Milk Fever, but did not use it now, as he had seen animals dying from some of the fluids escaping from the stomach and passing into the abdominal cavity. In the earlier stages of the fever he recommended strong purgatives, stimulants, and mustard to the back, but after the animal had gone down, treatment was of very little use.

Mr. AITKEN, junr., Dalkeith, recommended careful attention to the animal's diet at the period of parturition, plenty of exercise, and that the calf be allowed to suck, as measures of prevention.

The PRESIDENT, in closing the discussion, remarked, that while he agreed with much that had been said in reference to Parturient Apoplexy, there were some doctrines promulgated from which he must dissent, as, for example, the doctrine of the essayist that the disease was due to intestinal irritation. In almost all cases of irritation of the bowels, constipation, when present, was preceded by diarrhœa; such a phenomenon was not common in Parturient Apoplexy, there was usually constipation from the outset, and this he attributed to the paralysed condition of the sympathetic system of nerves. Granted that indigestion or derangement of the alimentary functions, when in existence, would exercise a material influence in producing such a disorder as the one under consideration at the period of parturition (and it was a well-known fact that in no animal is reflex nerve-irritation so marked in gastro-intestinal derangement as in cattle), he nevertheless held that it was only one factor in the production of the disease, and that we must look for some other in order to explain its prevalence in cows and its extreme infrequency in other animals; the mere throwing back of the volume of blood upon the system (as was thought by the essayist and others) would not explain it, as, if this were the case, other animals—especially the mare and the sow—would suffer equally with the cow. In an essay which he had the privilege of reading before the Association in 1872, on the subject of Parturient Apoplexy, he, the President, directed attention to the difference in the anatomical arrangement of the cerebral circulation in bovines, as compared with that of other animals, and he was still of opinion that this exercised some influence in the production of the malady; but a still more important factor was to be found in barometrical conditions, as it was a matter of common observation that when one case of the disease occurred it was almost invariably followed by several others, and that too without reference to local circumstances. In reference to the question as to the different periods connected with the act of parturition at which the affection makes its appearance, he thought that much confusion existed on the point in the minds of practitioners, and that this arose largely from the narrow views held as to the nature of these cases, which ought to be classed under three heads: Firstly, *Parturient Convulsions, Delirium*, or *Eclampsia*, and due to excentric

irritation, to loss of blood, or to anæmia of the brain (though the latter condition is stated by some to be present in all cases of Parturient Apoplexy—a great mistake), and occurring in all animals, of all ages, and in all kinds of condition; secondly, *Sanguineous Apoplexy* pure and simple, brought about by blood-pressure, favoured, probably, in adults and fat animals, by organic changes in the coats of the blood-vessels themselves; and, thirdly, *Capillary and Venous Congestion*, produced partly by a plastic condition of the blood, and partly by derangement of the vaso-motor nerve-centre, commencing in the vessels of the spine and travelling gradually towards the head. In these progressive cases the first symptoms observed are disorders of locomotion in the hind extremities, the impression gradually extending to the fore, thence to the cerebellum, onward to the cerebrum, and finally to the medulla oblongata; whereas, in Apoplexy, the animal was struck down suddenly, and unconsciousness supervened almost immediately. The two last conditions, the President remarked, might arise either before parturition (*ante-partum*), during the act (*parturient*), or after (*post-partum*), and might, indeed, occur at any period of the animal's existence quite independently of parturition. In reference to that class of cases which were supposed to occur some considerable time after parturition, he was of opinion that in many instances they were due to thrombosis or embolism, and were of a totally different nature than were those he had classified. As to treatment, he could not agree with those who held that "the less done the better for the patient." On the contrary, he believed that "the more done the better," provided it was in the right direction. Certainly, if the practitioner is called in before the animal falls, bleeding, cathartics, and stimulants, with external irritants, were called for, and, in his experience, had been more productive of good (coupled with forced exercise where practicable) than any other method of treatment; but when the patient was comatose, bleeding and cathartics were useless, as the blood would not flow, and, owing to paralysis of the organic functions, purgatives could produce no effect. Stimulants were, in his opinion, the only class of medicines to be relied on at this stage. Something had been said about the success of homœopathists. It was easily explained: seeing that the greatest indication as to treatment during the comatose stage was to prevent death by apnœa and by syncope, homœopathic treatment was the most rational, consisting as it did in the administration of respiro-cardiac stimulants in the shape of belladonna and nux vomica, readily given in the form of strong tincture on the tongue of the animal; ammonia, the President said, was equally valuable as a respiratory stimulant, but was not so easily administered. As to the modes of administration of medicines, the President pointed out that in the essay before alluded to he had strongly advised (and had done so for many years) the use of the cannula, as with a large instrument and the exercise of care he had never seen any accident happen such as had been alluded to by Mr. Cunningham; certainly he would not trust this mode of administration to ordinary persons. Ammonia could be readily administered in the form of ball, but he did not like the use of the probang, as it exerted considerable pressure on the larynx, and interfered with the passage of air into the lungs; and further, there was just the danger that in the withdrawal of the probang fluid might fall from it into the larynx: he thought that hypodermic injection was not sufficiently had recourse to in the treatment of the affection, considering that such facilities now existed for its practice. In the matter of prevention, much could be done in the direction indicated by some of the speakers, to reduce the number of cases of the disease, and he strongly advised the adoption of such measures, remarking that the disease was rarely seen in animals treated in a natural way. The President concluded by thanking the essayist for the practical manner in which he had placed the subject before them.

Army Veterinary Department.

Gazette, July 1st.

The undermentioned Veterinary Surgeons on probation to be Veterinary Surgeons :—John A. Braddell, Thomas A. Mitchell.

Obituary.

THE Registrar of the Royal College of Veterinary Surgeons reports the following deaths :—James Young, M.R.C.V.S., Newry, and W. Flannery, M.R.C.V.S., Cork, both of whom graduated in 1872; and G. B. Webb, M.R.C.V.S., Balsham, Cantab., a graduate of 1861.

Notes and News.

VETERINARY HONOURS.—The annual meeting of the Royal Society for the Prevention of Cruelty to Animals was held in St. James's Hall, London, Lord Aberdare in the chair, and among those present were Lord and Lady Wolseley, Lady Aberdeen, Lady and Mr. A. B. Burdett-Coutts, Sir Walter Stirling, Dr. B. W. Richardson, F.R.S. After the formal business of the meeting, Lady Burdett-Coutts presented the Queen's gold medal to Dr. Fleming, Principal Veterinary Surgeon to the Army, and Professor Pritchard, for their efforts to prevent cruel practices in the treatment of horses. This medal, designed and approved by Her Majesty, is a beautiful example of the medallist's art, and the first recipients of it have been these members of the veterinary profession.

M. Pasteur has received a gold medal from the French Central Society for improving the breeds of dogs, and for his researches in Rabies.

EAST AFRICAN HORSES.—Burton, on his journey to Harar, in East Africa, remarks :—"I was disappointed by seeing the boasted 'Faras' of the Somal, in the shape of ponies hardly thirteen hands high. The head is pretty, the eyes are well opened, and the ears are small; the form also is good, but the original Arab breed has degenerated in the new climate. They are soft, docile, and—like all other animals in this part of the world—timid: the habit of climbing rocks makes them sure-footed, and they show the remains of blood when forced to fatigue. The Gudabirsi will seldom sell their horses, the great safeguard against their conterminous tribes, the Eesa and Girbi, who are all infantry: a village seldom contains more than six or eight, and the lowest value would be ten cows or twenty tobes. . . . Whilst other animals have indigenous names, the horse throughout the Somali country retains the Arab appellation 'Faras.' This proves that the Somal, like their progenitors the Gallas, originally had no cavalry. The Gudabirsi tribe has but lately mounted itself by making purchases of the Habr Gerhajis and the Habr Awal herds."—*First Footsteps in East Africa*, p. 220.

SENSE OF SMELL.—In Java wild hogs are most destructive to the plantations. "The practice of suspending rags impregnated with urine, at small distance around the plantation, is universal over the whole island. These animals are said to have so violent an aversion to this odour, that even this 'feeble barrier' is useful in preserving the plantations."—*Stamford Raffles, Hist. Java*, vol. i., p. 50.

FEEDING FOR A JOURNEY.—The Mongols prepare their camels for a journey by depriving them of meat and drink for twelve days; and our horses are allowed to fast for a night to strengthen them—*Timkowski Travels through Mongolia to China*, vol. ., p. 12.

Correspondence.

RED MANGE IN DOGS.

DEAR SIR,—Referring to "Zero's" questions in the June number of the VETERINARY JOURNAL, with reference to "Red Mange" in dogs, will you kindly allow me, through the medium of your valuable Journal, to recommend him to consult the work on "Diseases of Dogs," by Mr. James Moore, M.R.C.V.S., which was published thirteen years ago.

I am, dear sir,

Yours truly,

"UBIQUE."

COMMENCING DEGENERATION OF THE PROFESSION.

DEAR SIR,—In studying natural history, the student sometimes comes across cases where a member or members of a group, after arriving at a certain stage of development, have, instead of developing into higher forms, as one would have expected from its previous history it would do, gone back or degenerated. And turning from natural history to the history of nations, we find instances of the same thing: where a nation, after attaining to a high state of civilisation, has not only failed to keep the high position already gained, but has retrograded. Reasoning from this, we come to the conclusion that a nation or an individual, after reaching a zenith higher or lower in different cases, degenerates. And if we take a profession, and reason from analogy, we will arrive at the same conclusion. Now, if this be so, and from the cases recorded we cannot doubt it, the fact—the melancholy fact—forces itself upon us, that the youngest of the professions, the veterinary profession, has not only reached its zenith, but has begun to go back.

Any one who has noted the results of the final examination for the past year, and compared them with the results of previous years, cannot fail to have noticed that during the past year not a single student at any of the colleges has passed his final examination with credit. And as the students of to-day will in no far-distant future form the profession, one cannot help thinking, sad though it be, that the profession, composed of such degenerated members, will occupy but a low place amongst the other professions.

And is this *really* so? Is the student of to-day so much behind the student of two, five, or ten years ago? Let us ask the teachers in the schools. What do they say? They will not allow it, and say that the student of to-day is an advance on the student of ten years ago in intellectual capabilities. What say the examiners? Here is what one of them said: "Half of the students who come up for examination should be rejected, and the other half kicked out of the profession." I would be sorry to think this latter statement was true, and would rather believe that that examiner was such a clever student himself that no student of the present day can reach his standard of excellence. Then how is it that students cannot obtain credit in their final examination? Obviously it must be the result of one or more of three causes. The teaching *at all the schools* must be defective, or the students of the past year were of inferior calibre, compared with those of previous years, or the examination is unreasonable. Which is it?

I remain, sir,

Yours sincerely,

Edinburgh, 23rd June, 1884. W. R. DAVISON, M.R.C.V.S.

DOCKING.

SIR,—A great deal of controversy seems at present to be going on about the operation of docking horses' tails. Much has been said *pro* and *con;* but it is not my intention here to argue the matter, as this would be time wasted. I intend simply to give you the method I have advocated and performed for the last nine or ten years. I remove one-third of the tail, not when an animal is two or three years old, but from three days to a month. The operation, which is really no operation at all, is performed in the following manner: Take hold of the end of the tail by one hand, and with a sharp knife in the other sever the tail any length you choose. Then tie a piece of string round the hair, close to the stump, and the operation is over. My experience shows me that the tail thus treated never grows beyond the "fancy" length; that it is much finer at the end; that there is no bare stump showing; there is no trouble in stopping the hæmorrhage, and the pain is reduced to a minimum.—Yours, etc.,

JOHN NETTELTON.

Northallerton, *July 14th*, 1884.

CORRIGENDA.

MR. CUNNINGHAM desires the following correction to be made in his letter which appeared in the Journal for last month. At page 71, para. 2, for "thickly populated," read "thinly populated (and less-favoured parts of the country)."

ANSWERS TO CORRESPONDENTS.

B. C.—There is a translation of Burggraeve's "Dosimetric Therapeutics" by H. A. Allbutt, published by D. Bogue, London, 1882.

M.R.C.V.S.—The questions pertaining to the last examination for the Fellowship Degree of the R.C.V.S. will be found in the Journal for this month.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from W. R. Davison, Edinburgh; J. Donald, Wigton; J. B. Wolstenholme, Manchester; F. Spencer, Wragby; G. A. Hollingham, Red Hill; "Ubique"; A. W. Hill, London; R. W. Burke, A.V.D., India; R. H. Dyer, Limerick; T. H. Lewis, Edinburgh; W. H. Blunt, Lutterworth; J. A. Nunn, A.V.D., Lahore; I. Matthews, A.V.D., Lucknow; J. Nettelton, Northallerton.

BOOKS AND PAMPHLETS: *F. Gutenäcker*, Die Lehre vom Hufbeschlag; *C. A. F. Lindorme*, Scientific Basis of Eclecticism in Medicine; *H. Pütz*, Ueber die Milzbrandimpfungen Pasteur's; *M. J. Hugues*, Hygiène Publique; *A. Zundel*, Quelques Considerations Economiques sur la Fièvre Aphteuse.

JOURNALS, ETC.: *Oesterreichische Vierteljahresschrift für Wissenschaftliche Veterinärkunde; Nature; Live Stock Journal; Archiv für Wissenschaftliche und Praktische Thierheilkunde; Annales de Médecine Vétérinaire de Bruxelles; Wochenschrift für Thierheilkunde und Viehzucht; Der Thierarzt; Lancet; National Live Stock Journal; Medical Times and Gazette; British Medical Journal; Der Hufschmied; Archives Vétérinaires; Edinburgh Medical Journal; Recueil de Médecine Vétérinaire; American Veterinary Review; Journal de Médecine Vétérinaire et de Zootechnie; Revue Vétérinaire; L'Echo Vétérinaire; Clinica Veterinaria; Medical Press and Circular; Animal World; Tidskrift för Veterinär-Medicin och Husdjursskötsel; Practitioner.*

NEWSPAPERS: *Daily News; South Eastern Gazette; Irish Times; Leeds Mercury; Glasgow Herald.*

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